Government of **Western Australia**
Child and Adolescent Health Service

TELETHON KIDS INSTITUTE
Discover. Prevent. Cure.

2020

Child Health Symposium

Program Book

Healthy kids, healthy communities

Compassion | Excellence | Collaboration | Accountability | Equity | Respect

Neonatology | Community Health | Mental Health | Perth Children's Hospital

Contents

Acknowledgements

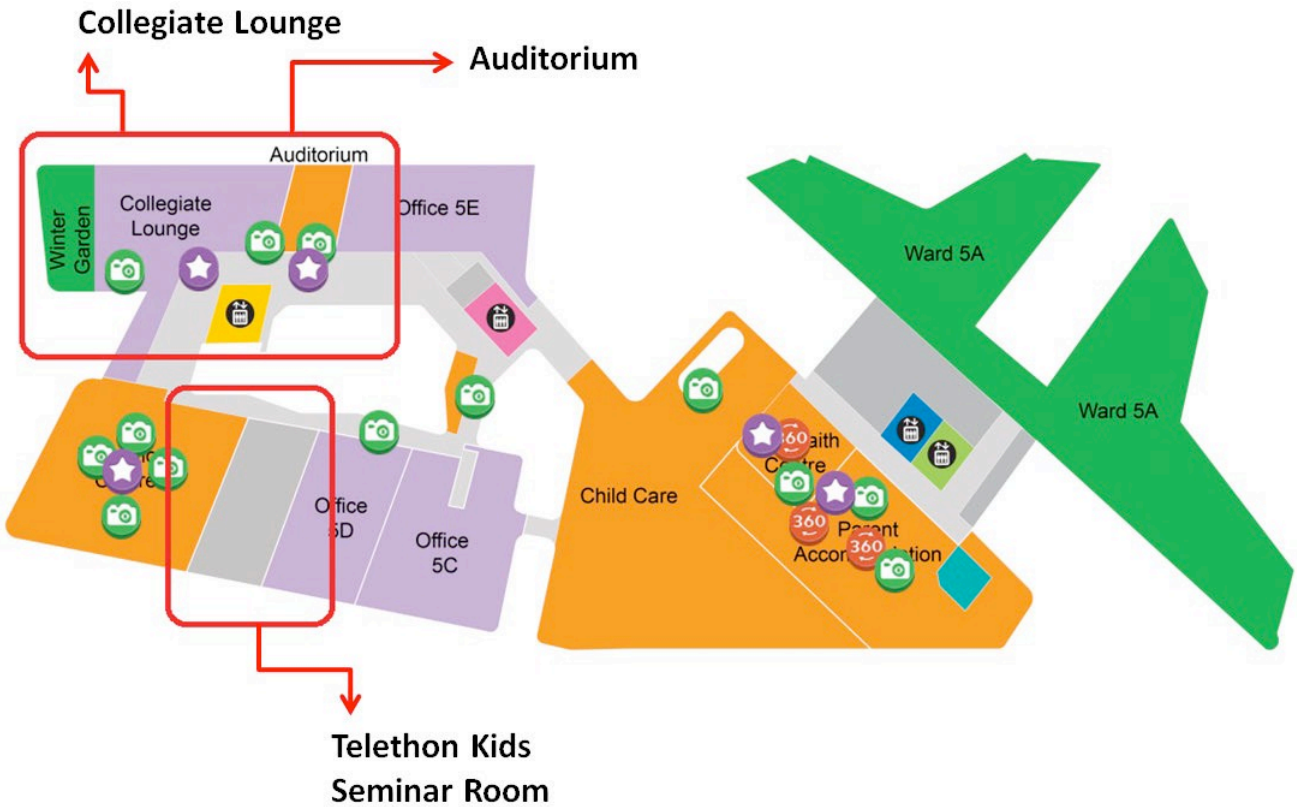
We extend our thanks to our partners Telethon Kids Institute, Perth Children's Hospital and the University of Western Australia. Thanks also go to the Child Health Symposium Organising Committee and all those who contributed to the prizes, planning, organisation and running of the Symposium.

We acknowledge Aboriginal and Torres Strait Islander people as the Traditional Custodians of the land and waters of Australia. We also acknowledge the Nyoongar Wadjuk, Yawuru, Kariyarra and Kaurna Elders, their people and their land upon which the venues for this event are located and seek their wisdom in our work to improve the health and development of all children

Locations

- Level 5, Perth Children's Hospital
  - Auditorium
  - Collegiate Lounge
  - Telethon Kids Seminar Room
- Level 6, The Manda, Telethon Kids Institute

Map of Level 5, Perth Children's Hospital



Program overview

Day 1 - Tuesday 3 November 2020
Telethon Kids Institute Science Showcase

7:30am - 9:00am	**Breakfast Session** ***Strategies for managing and mining big data*** Professor Radhouane Aniba, Telethon Kids Institute, The Manda, Telethon Kids institute	*The Manda, Level 6, Telethon Kids Institute*
10:00am - 10:30am	**Morning Tea and Event Registration**	*Foyer PCH Auditorium Foyer Area, Level 5*
10:30am - 12:00pm	**Welcome and Plenary Session:** ***Understanding and editing the epigenome - from basic discoveries to future therapies*** Professor Ryan Lister, UWA	*PCH Auditorium, Level 5*
12:00pm - 1:00pm	**Lunch**	*PCH Collegiate Lounge*
1:00pm - 1:30pm	**Concurrent Overview:** Aboriginal Health 1000 Families Update	*PCH Auditorium Level 5*

***Presented by Professor Juli Coffin**, the Ellison Fellow of Aboriginal Health Head, Social & Emotional Wellbeing of Aboriginal Young People, this session explores the Aboriginal led, community co-designed 1000 Families Initiative.*

1:30pm - 2:30pm **Concurrent Sessions:**

1. Research Focus Area – Brain and Behaviour *PCH Auditorium, Level 5*
Chair, Nick Buckley, Telethon Kids Institute

Taking a population monitoring approach to supporting students' social and emotional wellbeing and mental health within the education system David Engelhardt, Co-Director of the Fraser Mustard Centre, and Executive Director, Data Reporting and Analytics, Dept for Education South Australia Dr Tess Gregory, Child Health Development and Education Team

CliniKids: embedding research within clinical practice for children with or autism or developmental delay Professor Andrew Whitehouse, Head of the Autism Research Team and Director of CliniKids

A 10-year nationwide psychosocial autopsy of suicide in Australian youth using coronial data Nicole Hill, Telethon Kids

	Institute	
	2. Research Focus Area – Chronic and severe diseases Chair, Elizabeth Davis, Telethon Kids Institute ***New treatments for brain cancer*** Raelene Endersby, Telethon Kids Institute ***Wal-yan: bringing paed resp research under one umbrella*** Steve Stick, Telethon Kids Institute ***Systems vaccinology – what does it mean?*** Tobi Kollmann, Telethon Kids Institute ***A digital innovation for exercise and diabetes*** Vinutha Shetty, Telethon Kids Institute	*Seminar Room, Telethon Kids Institute*
	3. Research Focus Area – Early Environment Chair, Deborah Strickland, Telethon Kids Institute ***Immunity and Inflammation*** ***Infection and Vaccines*** ***Neonatal and Life Course Health***	*The Manda, Telethon Kids Institute*
2:30pm - 3:00pm	**Afternoon Tea**	*PCH Collegiate Lounge*
3:00pm - 4:30pm	**Concurrent Sessions:**	
	1. Early Career Research Presentations ***Developing a sensitive and specific SARS-CoV-2 antibody test.*** Sonia McAlister, Telethon Kids Institute ***COVID-19 in Ethiopia: A geospatial analysis of vulnerability to infection, case severity, and likelihood of death*** Kefyalew Alene, Telethon Kids Institute ***Pre-B Acute lymphoblastic leukaemia cells inhibit differentiation of osteoblasts.*** Vincent Kuek, Telethon Kids Institute ***Supporting Aboriginal children's cultural needs in early education settings.*** Larissa Perry, Telethon Kids Institute Larissa Perry, Telethon Kids Institute ***Childhood burn injury increases susceptibility to disease by disrupting immunity.*** Lucy Barrett, Telethon Kids Institute	*PCH Auditorium, Level 5*
	2. Early Career Research Presentations ***The role of mesenchymal stem cells in leukaemia development*** Anastasia Hughes, Telethon Kids Institute ***Are epithelial cell cytokines associated with atopic dermatitis during infancy?*** Cristina Gamez, Telethon Kids Institute ***Validation of a well-accepted method for SARS-CoV-2 paediatric swabbing through the DETECT Schools Study*** Hannah Thomas, Telethon Kids Institute ***Pre-clinical cranial radiotherapy as a mouse model of neurological late effects.*** Jessica Lawler, Telethon Kids Institute	*Seminar Room, Telethon Kids Institute*

	Early life respiratory infections perturb lung function in adulthood Laith Harb, Telethon Kids Institute	
	3. Early Career Research Presentations ***Can we improve aerosol delivery to children computationally?*** Natalie Anderson, Telethon Kids Institute ***Dense and diverse pneumococcal carriage in Papua New Guinean infants.*** Kate Britton, Telethon Kids Institute **Ezrin: a potential biomarker of respiratory epithelial repair and wheeze morbidity.** Thomas Iosifidis, Telethon Kids Institute ***The PATRIC (Pragmatic Adaptive Trial for Respiratory Infections in Children) Registry.*** Mejbah Bhuiyan, Telethon Kids Institute ***Influenza hospitalisation and vaccination in Australian children: 2010-2019.*** Daniel Norman, Telethon Kids Institute	*The Manda. Telethon Kids Institute*
5:00pm – 6.00pm	**Networking and Telethon Kids Institute Awards Sundowner**	**The Manda, Telethon Kids Institute**

Day 2 - Wednesday 4 November 2020		
7:30am - 9:00am	**Breakfast Session** ***Big Ideas simple questions – Cohort, Registries and Data Governance*** Professor Toby Richards, UWA	*The Manda, Telethon Kids Institute*
10:00am - 10:30am	**Morning Tea and Event Registration**	*PCH Auditorium Foyer Area*
10:30am - 12:00pm	**Welcome and Plenary Session: Bring Ideas to Life** Professor Fiona Wood, CAHS / SMSH / UWA	*PCH Auditorium, Level 5*
12:00pm - 1:00pm	**Lunch**	*PCH Collegiate Lounge*
1:00pm - 2:30pm	**Concurrent Sessions:**	
	1. Creating clinical impact ***Toddler's Fracture Immobilisation (ToFI) Study*** Kate Bradman, CAHS ***Consensus statement to prevent respiratory illness in children with cerebral palsy*** Noula Gibson, CAHS ***Culturally informed healthcare transforms lung health for Aboriginal children*** Pamela Laird, CAHS ***Tramadol chocolate oral formulation: acceptability and tolerability*** Aine Sommerfield, Telethon Kids Institute ***Development and Validation of a Screening Instrument to***	*PCH Auditorium, Level 5*

Predict Aggressive Behaviour in the Hospital Setting: The BRACHA Initiative
Vincent Mancini, CAHS

Utility of Bedside Ultrasonography in realignment of Forearm Fractures at Paediatric Emergency Setting
Simon Green, CAHS

2. Child and Adolescent Community Health showcase

Seminar Room, Telethon Kids Institute

Current research context in Community Health
Deborah Flynn and Terri Barrett, Community Health Co-Directors

Community Health study showcases:

Assessment of psychosocial wellbeing for students transitioning to secondary school
Dr Ailsa Munns

The Child Development Service ADHD Clinical Care Pathway
Dr Rona Kelly

Identifying risk factors that predict developmental delay at 2 years Karen Forde

Clinical effectiveness and business feasibility of providing online therapeutic information to parents of children with communication difficulties
Dr Chris Lewis

Measuring parent and child outcomes in the Child Development Service
Dr Jodie Armstrong and Karen Nitsche

Closing round table discussions
Potential research opportunities and partnerships that can strengthen the health and well-being of children across Perth.

How can virtual care tools and technology be used to measure, monitor, treat and intervene in childhood developmental delays and disorders?

What increased role could Community Health take to effectively support and promote the mental well-being of primary school children?

What strategies are successful and feasible at engaging hard to reach clients in our child development and nursing services?

Moort Maat-bidi (family journey) & The First 100 days: How would you evaluate a program using the social and emotional wellbeing framework?

3. Supporting healthy lifestyle behaviours and environments

The Manda, Telethon Kids Institute

Passive consent: A method of recruiting more representative survey samples
Donna Cross, Telethon Kids Institute

High intensity interval training in an aquatic environment does not increase pain in adolescents with cerebral palsy
Nadine Smith, CAHS

Evidence-based practice and practice-based evidence: lessons learned from the PLAYCE Policy Project

	Andrea Nathan, Telethon Kids Institute ***The impact a Mediterranean Diet in pregnancy on neonatal body fat composition: The ORIGINS cohort*** Danella Ashwin, Telethon Kids Institute ***Fit for Play: Integrating physical activity into children's mental health recovery*** Kathryn Fortnum, UWA ***Cystic Fibrosis and Family Surfing Program: A Pilot Study*** Joanna White, CAHS	
2:30pm - 3:00pm	**Afternoon Tea**	*PCH Collegiate Lounge*
3:00pm - 4:30pm	**Concurrent Session:**	
	1. Lightning talks (5 minute research presentations) ***An innovative model for training in chest drain insertion for pneumothorax*** Sachin K Agrawal, CAHS ***Preschool Autism Therapy: A randomised-controlled trial of communication therapies*** Sarah Pillar, Telethon Kids Institute ***Neonatal lung disease predisposes children with cerebral palsy to later respiratory disease*** Natasha Bear, CAHS ***Omics integration to assess in vitro rhinovirus infection in children*** Patricia Agudelo-Romero, Telethon Kids Institute ***Developing a prediction model to estimate the true burden of RSV in hospitalised children in Western Australia (WA)*** Amanuel Gebremedhin, Telethon Kids Institute ***Coping with chronic disease: The relationship between stigma and diabetes outcomes*** Jesse Ingram, UWA ***Meeting Australian 24-Hour Movement Guidelines is associated with better pre-schooler social-emotional development*** Hayley Christian, Telethon Kids Institute ***The Effect of SMS-Reminders on Child Health in Parents of Newborns*** Mudra Shah, Telethon Kids Institute ***An Aboriginal-led culturally secure approach to enhancing social and emotional wellbeing among Aboriginal young people: The Yawardani Jan-ga ("Horses Helping") Program*** Juli Coffin, Telethon Kids Institute ***Supporting family conversations about alcohol use in adolescence*** Robyn Johnston, Telethon Kids Institute ***Parental Understanding of Medication Advice Labels: A Qualitative Study***	*PCH Auditorium, Level 5*

	Zainab AL KHAYRALLAH & Rose Ann MEDRIANO, UWA ***Kids Voices: Improving Perioperative Care for Children Undergoing Tonsillectomies*** Megan Dodd, Telethon Kids Institute	
	2. Early-mid career research presentations ***Closed loop system on glycaemic outcomes in adolescents with Type 1 diabetes in a clinical trial*** Mary B Abraham, CAHS ***Factors associated with developmental vulnerability in Aboriginal and Torres Strait Islander children who were born preterm in Western Australia.*** Shobana Maruthayanar, CAHS ***Increasing incidence and severity of anaphylaxis in very early childhood*** Natasha Moseley, CAHS ***Outcome for acute leukaemia is influenced by ethnicity and geography in Australia*** Sandra Ruhayel, CAHS ***Time spent outdoors in childhood is associated with reduced risk of myopia as an adult*** Gareth Lingham, UWA ***Volume of Gadolinium Enhancement and Successful Repair of the Blood-Brain Barrier in cALD*** Michelle Ng, CAHS	*Seminar Room, Telethon Kids Institute*
4:30pm – 6:30pm	**Evening Poster Session and Networking**	**PCH Collegiate Lounge**
Day 3 – Thursday 5 November 2020		
7:30am - 9:00am	**Breakfast Session** **Digital Health Workshop** Facilitator: Tara McLaren, Telethon Kids Institute	*The Manda, Telethon Kids Institute*
10:00am - 10:30am	**Morning Tea**	*PCH Collegiate Lounge, Level 5*
10:30am - 12:00pm	**Plenary Session:**	
	Getting to grips with COVID-19 – research success and future impacts*.** Chaired by Peter Richmond, CAHS ***DETECT Project: understanding the impacts of the COVID-19 pandemic in Western Australian schools. Peter Gething, Telethon Kids Institute ***BRACE your CoCo: The global role of Telethon Kids & CAHS in cutting-edge COVID trials.*** Tobias Kollmann, Telethon Kids Institute	*PCH Auditorium, Level 5*

12:00pm - 1:00pm	**Lunch**	*PCH Collegiate Lounge, Level 5*
1:00pm - 2:30pm	**Concurrent Sessions:**	
	1. Multicentre research initiatives: Outcomes and lessons learnt ***Validation of WINROP (online prediction model) to identify severe retinopathy of prematurity (ROP) in an Australian preterm population: a retrospective study.*** Saumil Desai, CAHS ***Video laryngoscopy: standard versus non-standard blades within the Paediatric Difficult Intubation Registry*** Elisa Robey, CAHS ***Risk of Leukaemia in Children with Peripheral Facial Palsy*** *Meredith* Borland, CAHS ***Metabolomics to predict asthma in preschool children*** Andre Schultz, CAHS ***The pipeline to validating a severity measure for the CDKL5 Deficiency Disorder.*** Jacinta Saldaris, Telethon Kids Institute ***FOT Equipment: From an Italian laboratory bench to paediatric theatres in W.A.*** Julie Nguyen, CAHS	*PCH Auditorium Level 5*
	2. Innovation culture – driving game changing shifts in clinical understanding and care ***Remote After-Care Using Smartphones: Automated SMS to monitor children's pain at home*** Thomas Drake-Brockman, UWA ***A novel mHealth Application for young people with type1 diabetes to exercise safely*** Vinutha B Shetty, Telethon Kids Institute ***NOSE - A pilot study to determine feasibility of newborn nasal sampling*** Liz Starcevich, Telethon Kids Institute ***EHMT1 CRISPR modification in HEK293 cells recapitulates Kleefstra Syndrome disease phenotype*** Vanessa Fear, Telethon Kids Institute ***Cardiac remodelling post mitral valve surgery in paediatric rheumatic heart disease*** Adrian Tarca, CAHS ***Arresting dental caries in refugee children: a conservative approach*** Jilen Patel, UWA	*Seminar Room, Telethon Kids Institute*
	3. Consumer and Community Involvement showcase Join us for an overview of effective ways to involve and engage consumers and the community in research	*The Manda, Telethon Kids Institute*

2:30pm - 3:00pm	**Afternoon Tea**	*PCH Collegiate Lounge, Level 5*

3.30pm – 5.30pm	**Closing Plenary Session:**	
	Chaired by A/Professor Paul Watt, Telethon Kids Institute	*PCH Auditorium, Level 5*

Message from the Child and Adolescent Health Service (CAHS)

Dr Aresh Anwar
Chief Executive CAHS

I am delighted to welcome staff and visitors to our third annual Child Health Symposium at Perth Children's Hospital in conjunction with our joint hosts the Telethon Kids Institute.

CAHS is committed to taking a lead role in child health research in Western Australia because it's integral to our vision of 'healthy kids, healthy communities'.

The symposium reflects our partnership with Telethon Kids Institute, and the commitment of our staff to striving for clinical excellence. Together we are helping to deliver cutting edge treatment and services to children and families across WA.

The symposium provides a great forum to celebrate and showcase our commitment to collaboration, not only between our two institutions, but also with the many other research partners with whom we work. The symposium provides an important platform for researchers at all levels of their career to share their work with a broader audience. It is also an opportunity to come together to identify ways of building even stronger connections across our research community.

The resounding response from researchers engaging in the 2020 symposium during this difficult year of the COVID 19 pandemic has been remarkable. With a record number of presentations, the symposium will be our biggest to date.

I am confident that attendees will enjoy the wide range of events and presentations on offer this year. Congratulations to symposium organisers who have put together a broad and diverse program.

On behalf of the CAHS Executive and Board, I thank all involved in this symposium for your commitment to research. We salute your collective contribution to supporting better outcomes for our patients and families by paving the way towards new treatments, more effective services and discovering more about the diseases and conditions we treat.

We look forward to being inspired by the presentations.

Dr Aresh Anwar

Chief Executive CAHS

Message from Telethon Kids Institute

Professor Jonathan Carapetis

Executive Director, Telethon Kids Institute

The Telethon Kids Institute is proud to again be partnering with the Child and Adolescent Health Service (CAHS) to deliver the 2020 Child Health Symposium.

In what has been an extraordinary year, coming together for the Symposium to share our research and explore the challenges and opportunities we face as researchers and clinicians, seems even more important than ever.

The COVID-19 pandemic has challenged how we all work, but it has also brought to the fore the importance of medical research. This presents a moment in time, and a chance to shape the future of medical research.

The plenary session for the first day of the Symposium will look at innovation in the time of COVID, and is set to be a fascinating presentation.

This year, the first day of the Symposium will be hosted by Telethon Kids as a Scientific Review day. The sessions by our Research Focus Areas are an excellent opportunity to better understand how we undertake our research at Telethon Kids and find out more about the incredible work being done at the Institute. Leading these concurrent sessions will be an update on our ambitious Aboriginal Health Grand Challenge, which we hope will deliver many benefits for Aboriginal children and their families.

The Symposium is about celebrating outstanding achievements as well as encouraging greater collaborations and connections. At Telethon Kids, we recognise and value how important the relationship is between the Institute and CAHS. Increasingly, we are working together to break down the traditional boundaries between research and clinical practice, and I have no doubt that this will lead to even better health outcomes for Western Australian kids and their families.

No matter what your expertise or area of interest is, there is a lot to look forward to in this year's Symposium program. Telethon Kids is again hosting the breakfast sessions in the Manda on level 6 (east) and we hope to see many of you there. CAHS staff can also access the Manda during business hours using your hospital access card, so feel free to come and say hello, enjoy the free coffee, and have a chat to our Institute staff and students.

Enjoy the Symposium!

Jonathan Carapetis

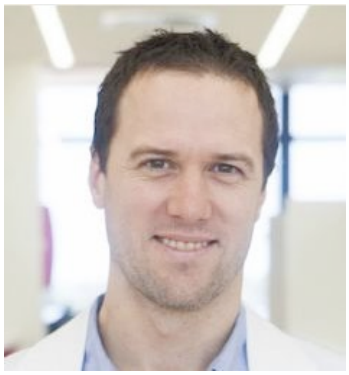
Keynote Speaker Biographies

Keynote Speakers are internationally acknowledged guest speakers invited to share their work, expertise and insight in current key areas of Child Health Research.

Professor Fiona Wood is a burns surgeon and researcher and is Director of the Burns Service of Western Australia (BSWA). She is a Consultant Plastic Surgeon at Fiona Stanley Hospital and Perth Children's Hospital; co-founder of the first skin cell laboratory in WA; Winthrop Professor in the School of Surgery at The University of Western Australia; and co-founder of the Fiona Wood Foundation.

Professor Wood's greatest contribution and enduring legacy is her work with co-inventor Marie Stoner, pioneering the innovative 'spray-on skin' technique (Recell), which is today used worldwide. In October 2002, Fiona was propelled into the media spotlight when the largest proportion of survivors from the 2002 Bali bombings arrived in Perth where Fiona led the medical team at Royal Perth Hospital to save many lives.

Fiona was named a Member of the Order of Australia (AM) in 2003. In 2004 she was awarded the Western Australia Citizen of the Year award for her contribution to Medicine in the field of burns research. Fiona was then named Australian of the Year for 2005. She is an Australian Living Treasure. Fiona is a Fellow of the Australian Academy of Health and Medical Science.



Professor Ryan Lister leads a research group investigating the epigenome and cell identity, at the University of Western Australia and the Harry Perkins Institute of Medical Research. In 2020 he was elected as a Fellow of the Australian Academy of Science. After receiving his PhD in Biochemistry and Molecular Biology from the University of Western Australia in 2005, Ryan undertook postdoctoral studies at The Salk Institute for Biological Studies in California, USA, where he developed and applied new genomics techniques to map the epigenome and transcriptome. Having returned to the University of Western Australia in 2012, Ryan's laboratory is focused upon understanding the role of the epigenome in regulating cell identity, and developing molecular tools to manipulate the epigenome and gene activity to control cell functions. Ryan was recently awarded 2020 WA Scientist of the Year and his work has been featured in Time Magazine.

Plenary session: *Getting to grips with COVID-19 – research success and future impacts*

Professor Tobias Kollmann is a paediatric infectious diseases physician with a deep passion for making an impact at the convergence of clinical care and fundamental research. He is the Telethon Kids Head of the First 1001 Days team, where multi-disciplinary research aims to transform the early life trajectory of young babies conceived and born anywhere in the world. Professor Kollmann completed both his PhD (1996) and MD (1998) at the Albert Einstein College of Medicine, New York, USA and was Head, Paediatric Division of Infectious Diseases at UBC before relocating to Australia. Professor Kollmann is co-funded by the Perth Children's Hospital Foundation and leads the Institute's involvement in the Human Vaccine Project (HVP) with Telethon Kids as the only partner outside of North America. The project's mission is to decode the human immune system to transform human health research, public health education, and service with collaborating faculty from USA, UK, and Canada.

Professor Peter Gething is the Kerry M Stokes AC Chair in Child Health at Curtin University and the Telethon Kids Institute. He is director of the Malaria Atlas Project, a World Health Organization Collaborating Centre in Geospatial Disease Modelling (WHO CC). Peter has worked in tropical health since 2002. His first degree was in Geography and he read for his PhD at Southampton in the Schools of Geography and Electronics and Computer Science, developing spatio-temporal geostatistical approaches for improving the fidelity of imperfect routine reporting data on presumed malaria in Africa. In 2005 Pete became a member of faculty at Southampton as a lecturer in GIS, before joining the Malaria Atlas Project at the University of Oxford in 2008 where he became an MRC Career Development Fellow in 2012. He was appointed as Professor in Epidemiology at the Big Data Institute, University of Oxford in 2016 until moving to Perth in 2019. Pete's interests are in the development and application of empirical and biological models to address policy-relevant questions in tropical health.

Assoc Prof Chris Blyth is a clinical academic, NHMRC Emerging Leadership Fellow with the School of Medicine, University of Western Australia (based at Telethon Kids Institute), Paediatric Infectious Diseases Physician at Perth Children's Hospital (PCH) and a Clinical Microbiologist with PathWest Laboratory. Chris has nearly two decades experience in conducting clinical paediatric and infectious diseases research focusing on questions relevant to public policy and clinical practice. The majority of his research is in influenza, vaccine-preventable respiratory tract infection, pneumonia and vaccine safety. In 2012 Chris was appointed as a sitting member of the Australian Technical Advisory Group on Immunisation (ATAGI), Australia's peak immunisation advisory group to Government, and he assumed the role of deputy chair in 2014 and co-chair in 2018. In addition, he is chair of the ATAGI Pneumococcal Working Party and member of the ATAGI Influenza Working Party. Through these positions, he has been instrumental in a number of significant changes in the national immunisation policy.

Closing plenary panel – *Towards a digital health vision for Western Australia*

This is all-star cast drawn from sessions held across the Symposium and chaired by **Liz Dallimore**, the current Director of the WA Data Science and Innovation Hub. She is joined by **Professor Radhouane Aniba**, **Dr Sarah Doyle, Professor Desiree D'Silva** (Director of The ORIGINS Project), **Assoc Prof Chris Blyth** (lead, CAHS Digital Health Platforms) and **Dr Carlo Bellini** (Chief Medical Officer, Chevron Australia. The wealth of this group lies in their willingness to explore what can be achieved across healthcare using innovative digital platforms. Join us to discuss the challenges, possibilities and key steps needed to forge a digital health future in WA

Guest Chairs

Telethon Kids Institute, Research Focus Area updates

Nick Buckley is a second year PhD student at the Telethon Kids Institute; his PhD aims to develop a tool to measure movement and position during sleep, and apply this tool to typically developing children and those with Cerebral Palsy. As a Research Officer in the Institute's Child Disability team, he also helps manage the ActivRett clinical trial which delivers physiotherapy input to women and girls with Rett syndrome via tele-health. In 2019, Nick was part of the winning team for the Perth Biodesign Pitch. With a strong interest in commercialisation of research, he is the Co-Founder and Director of VeinTech, a Perth-based medtech start up.

Professor Elizabeth Davis is a paediatric endocrinologist with a long interest in clinical and translational research in T1DM in children and adolescents. She is the Head of the Diabetes Clinical Services at Perth Children's Hospital in Western Australia and co-lead of the Diabetes and Obesity Research team at Telethon Kids, a busy research team which has one stream of research focusing on exercise. Her particular research interest is clinical research which improves the lives of children with diabetes. She is the current president of the Australasian Paediatric Endocrine Group. Professor Davis is also a Clinical Professor at the University of Western Australia.

Professor Deborah Strickland Associate Prof Strickland completed her PhD at the University of WA in the regulation of immune homeostatic processes in the respiratory tract. She received a prestigious Elizabeth Albeiz Fellowship (Multiple Sclerosis Society of Australia) for post-doctoral studies at the Centenary Institute, Sydney.

Following this, her postdoctoral work focused on establishing an independent program of research to explore the pathogenic mechanisms associated with risk for allergic asthma inception and progression, particularly during early life. In parallel, she has established a complimentary research program to explore how inflammatory responses that occur in the mother during gestation can perturb the developing fetal immune system to result in increased risk for a range of diseases (including respiratory, metabolic, and neurological systems) in later life.

Her research program is targeted towards addressing key fundamental gaps in the understanding of immune development, homeostatic mechanisms and how the immune system can be programmed to drive increased disease susceptibility, or trained to mitigate disease risk, with the overarching goal of developing potential preventive strategies. Her current positions are as Team Leader Experimental Immunology, Athena Swan Chair, Early Environment Research Focus Area chair, Adjunct Assoc Prof UWA.

Symposium Opening session (Wednesday)

Adjunct Professor Paul Watt is the Director of Research Services and Innovation at the Telethon Kids Institute. A graduate from the University of Western Australia, Paul completed his doctorate in Molecular Biology at Oxford University before taking up postdoctoral appointments at Harvard and Oxford. He was subsequently appointed Adjunct Professor at the University for Western Australia. For the last 20 years he has focused on technology translation, with various roles in public and private biotechnology companies over the last 18 years, including CSO, CEO, Chair and non-executive director.

Plenary session: *Getting to grips with COVID-19 – research success and future impacts*

Professor Peter Richmond the Director of the CAHS Department of Research and a Consultant Paediatric Immunologist and Paediatrician at Perth Children's Hospital (PCH). He also is the Head of Division of Paediatrics, School of Medicine at the University of Western Australia.

Peter leads the Vaccine Trials Group at Telethon Kids Institute, and has interests in the evaluation of new vaccines designed to prevent bacterial and viral infections in the paediatric population, and understanding protective immunity infectious disease in young children.

Closing plenary panel – *Towards a digital health vision for Western Australia*

Dr Liz Dallimore is currently the Director of the WA Data Science Innovation Hub and Executive Chair of Medtech startup Inspiring.

Liz was previously the National Director of Research Engagement & Commercialisation at KPMG and has more than 15 years experience in research, innovation and technology across the UK and Australia, with a key focus on the biotechnology industry. A biomedical scientist by training, Dr Dallimore commenced her PhD in Neuroscience at the University of Oxford and completed it at The University of WA. She worked at the Perron Institute from 2000-2001 in the Stroke Research group, and was a Board member of the Institute from 2016 to 2020.

Overview of sessions

The Symposium Breakfast sessions have fast become a must register for event over the last couple of years. These sessions are delivered in workshop style by industry experts and are designed to provide attendees with an overview of the current topic status with working examples. Attendees will leave the session with basic working knowledge and appreciation of the practical considerations for the topic being covered. Held 7.30-9.00am in The Manda, Telethon Kids Institute, breakfast provided.

Strategies for managing and mining big data

Professor Radhouane Aniba is the Head of Research Data Strategy at Telethon Kids Institute. Dr. Rad Aniba completed his PhD at the University of Strasbourg in France. He is an experienced data professional specialized in building data-driven products. With more than ten years of experience in the healthcare industry, Rad is an expert in setting up large scale systems for data processing and analysis optimizing workflows and processes. Dr Aniba's expertise ranges from Data Strategy to Governance, Policies and Frameworks to implement data transformational solutions, business intelligence and visualization systemsJoin us for this breakfast session to workshop basic data infrastructure and strategy to ensure easy to navigate datasets and for producing your intended outcomes.

Big Ideas simple questions – Cohort, Registries and Data Governance

Professor Toby Richards recently moved from UCL after nine years to take up the Lawrence-Brown Professor of Vascular Surgery and is the current Director of Clinical Trials at the University of Western Australia, based at Fiona Stanley Hospital. Toby was served as director of the UCL Surgical Trials Units with a particular interest in collaborative networks to promote audit and research. With a track record in large clinical trials, Toby has recognised expertise in developing and implementing clinical registries. Please join us for this important session to unpick the steps involved to set up a successful registry.

Digital Health Workshop

Join in to hear from this expert panel facilitated by **Tara McLaren**, the Senior Manager of Research and Development at Telethon Kids Institute. She will be joined by **Sarah Doyle** (What the Doctor Said), **Catherine Resnick** (KinChip Systems) and **Arthur Ong and Mohinder Jaimangal** (Curve Tomorrow). This panel is a wealth of knowledge and experience in navigating the Digital Health space. This session promises to deliver valuable insight and practical advice for anyone considering or venturing into this rapidly growing health interface.

The Aboriginal Health 1,000 Families Update. The 1000 Families Initiative is a research partnership between BHP and the Telethon Kids Institute to improve the life trajectories of Aboriginal children in three sites in Western Australia: Port Hedland, Newman and Perth. The Initiative is Aboriginal-led with strong local cultural guidance in each of the three sites. It will work directly with Aboriginal families to understand what cultural, environmental and policy frameworks they need - what is working, what is not - to ensure the best possible early childhood outcomes, even when faced with profoundly difficult and disadvantaged circumstances.

This update will be presented by Juli Coffin, Telethon Kids Institute with chair Professor Catherine Elliott (Director of Research, Telethon Kids Institute)

The Evening poster session features research posters selected from submitted abstracts. This session enables presenters to take questions and engage in discussion with guests in an informal environment.

Concurrent oral presentations are selected from submitted abstracts. Each session comprises six 10 minute presentations, with an additional five minutes allocated to each speaker to take questions from the audience. These sessions will open with a clinical or research update from a specialist area.

Invited chairs for these sessions:

Telethon Kids Institute Early Career researchers oral presentations: Assoc Prof Asha Bowen (PCH Auditorium), Assoc Prof Ashleigh Lin (Telethon Kids Institute Seminar room), Dr Sebastien Malinge (Telethon Kids Institute 'The Manda')

Creating Clinical Impact: Julien Graciet (CAHS, A/Head of Physiotherapy)

Supporting Healthy Lifestyle Behaviours & Environments: Professor Catherine Elliott (Telethon Kids Institute, Director of Research)

Early mid-career researchers oral presentations: Assoc Prof Sarah Cherian (CAHS, Head of Refugee Health)

Multicentre research initiatives: Outcomes and lessons learnt: Dr Simon Erickson (CAHS Head, Neonatal Surgery)

Innovation culture – driving game changing shifts in clinical care: Assoc Prof Paul Watt (Telethon Kids Institute Director, Research Services and Innovation)

Lightning talks are five minutes long and limited to three slides for each presentation. Presentations are run sequentially with speakers invited back at the end for questions from the audience. Speakers are selected from submitted abstracts.

Invited chairs for this session:

Assoc Prof Fenella Gill (CAHS Nursing Research) and Sonia McAlistair (Telethon Kids Institute)

Oral Abstracts
Tuesday 3 November

Concurrent Oral Presentations
Early Career Research Presentations
PCH Auditorium, 3.00 – 4.30 pm
Chair: Assoc Prof Asha Bowen

Developing a sensitive and specific SARS-CoV-2 antibody test

McAlister S[1,2], van den Biggelaar A[1,2], Thornton R[1,3], Ludewick H[4], Pavey W[4,5] and .

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Background and aim: Serological tests are needed to reveal prior exposure to, and duration of immunity against SARS-CoV-2. Bioplex technology offers a promising alternative to conventional ELISA as it is 10 - 1000 times more sensitive, requires substantially less sample volume and is considerably higher-throughput. We have assessed the compatibility of measuring SARS-CoV-2 receptor-binding-domain (RBD) antibody responses in human blood using Bioplex technology.

Research method: Assay test conditions were optimised using biobanked specimens from recovered COVID-19 patients (n=9) and historical controls (n=3) collected prior to the emergence of SARS-CoV-2. An in-house reference serum was developed by pooling the highest - titre samples. Antibody titres of test samples (n=12) were measured against the in-house reference serum (AU/ml).

Results: No major incompatibilities between SARS-CoV-2-RBD and the Bioplex platform were identified. SARS-CoV-2-RBD was successfully coated on Bioplex microspheres at an optimal dose of 50ug/ml. Signals were comparable when microspheres were tested individually or in combination with other common vaccine targets. Depleting SARS-CoV-2-RBD antibodies from serum prior to Bioplex analysis abrogated signals by >94%. Together this data suggests the antibody responses detected by the Bioplex assay are specific to SARS-CoV-2-RBD.

Test data showed variable antibody responses to SARS-CoV-2-RBD based on SARS-CoV-2 exposure. Signal was detected in historical samples suggesting there is cross-reactivity to seasonal Coronaviruses.

Conclusions: This high throughput antibody test can accurately measure systemic immunity to COVID-19 and will therefore be an important tool for guiding public health and vaccination policy. Future work will expand this assay to measure additional SARS-CoV-2 targets and the mucosal response (salivary IgA/IgG).

COVID-19 in Ethiopia: A geospatial analysis of vulnerability to infection, case severity, and likelihood of death

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Background and aim: COVID-19 has caused a global public health crisis affecting most countries, including Ethiopia, in various ways. This study maps the vulnerability to infection, case severity, and likelihood of death from COVID-19 in Ethiopia.

Research method: Thirty-eight potential indicators of vulnerability to COVID-19 infection, case severity and likelihood of death, identified based on a literature review and the availability of nationally representative data at a low geographic scale, were assembled from multiple sources for geospatial analysis. Geospatial analysis techniques were applied to produce maps showing the vulnerability to infection, case severity, and likelihood of death in Ethiopia at a high level of resolution (1 km X 1 km).

Results: This study showed that vulnerability to COVID-19 infection is likely to be high across most parts of Ethiopia, particularly in the Somali, Afar, Amhara, Oromia, and Tigray regions. The number of severe cases of COVID-19 infection requiring hospitalisation and intensive care unit admission is likely to be high across Amhara, most parts of Oromia and some parts of the Southern Nations, Nationalities, and Peoples' Region. The risk of COVID-19-related death is high in the country's border regions, where public health preparedness for responding to COVID-19 is limited.

Conclusions: This study revealed geographical differences in vulnerability to infection, case severity, and likelihood of death from COVID-19 in Ethiopia. The study offers high-resolution maps that can guide the targeted interventions necessary to contain the spread of COVID-19 in Ethiopia.

Pre-B Acute lymphoblastic leukaemia cells inhibit differentiation of osteoblasts

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1 Telethon Kids Cancer Centre, Telethon Kids Institute, University of Western Australia, Perth, 2 School of Pharmacy and Biomedical Sciences, Curtin University, Perth, 3 Department of Haematology and Oncology, Perth Children's Hospital, Perth

Background and aim: Children with pre-B acute lymphoblastic leukaemia (ALL) often suffer from skeletal abnormalities such as bone loss and bone fractures due to pathological remodelling of bone marrow microenvironment by the leukaemia cells. Despite this, the mechanism of pre-B ALL-induced bone loss remains unclear. In this study, we investigated the effects of pre-B ALL cells on differentiation, apoptosis, cell number and cell cycle of osteoblasts.

Research method: Osteogenic induction of MC3T3-E1 osteoblast precursor cell line was performed in the presence of mouse pre-B ALL cells transduced with p185-BCR-ABL-mCherry using a transwell co-culture system. The differentiation potential of MC3T3-E1 cells was quantified by alkaline phosphatase staining 7 days-post co-culture.

(1) Osteogenic induction of MC3T3-E1 cells was performed for 7 days, followed by 3 days of transwell co-culture with pre-B ALL cells. MC3T3-E1 cells were trypsinised and cell count was performed. Cell cycle and apoptosis were evaluated by staining the cells with DAPI and Annexin V, followed by flow cytometry analysis.

Results: We found that pre-B ALL cells significantly reduced alkaline phosphatase activity of MC3T3-E1 cells following osteogenic induction. Furthermore, we found that pre-B ALL cells reduced Annexin V expression of differentiating MC3T3-E1 osteoblasts but did not significantly affect cell cycle (i.e. G1, S, G2/M phases) and cell number.

Conclusions: Our study shows, for the first time, that pre-B ALL cells inhibit osteoblast differentiation without negatively impacting the growth of osteoblasts. Taken together, targeting the crosstalk mechanism between leukaemia cells and osteoblasts may be a therapeutic strategy for pre-B ALL.

Supporting Aboriginal children's cultural needs in early education settings

Perry L[1], Ilich N[1], Farrant B[1]

1 Telethon Kids Institute

Background and aim:
Early Childhood Education and Care (ECEC) is a community identified priority of the Ngulluk Koolunga Ngulluk Koort (Our Children, Our Heart) program. The aim of this project was to develop a resource to support parents/carers in sharing cultural needs with ECEC educators to improve cultural security.

Research method: A three-phase design was implemented with pre (*n=32*) and post (*n=20*) assessments and yarning sessions with parents/carers, and an implementation phase. Questions assessed the importance that parents/carers placed on providing advice to ECEC educators about cultural needs and their confidence to do so. Based on parent/carer yarns, a thematic analysis was conducted to facilitate the development of a resource in a co-design process with the ECEC Elder Co-Researcher subgroup. During the implementation phase, parents/carers used the resource for their own children (*n=55*).

Results: Using the resource contributed to an increase in the importance and confidence amongst participants to provide advice to support their child's cultural needs. Significant findings suggested that parents/carers felt confident using the resource; the resource supported their child's cultural needs; and the resource would be valuable for all Aboriginal families.

Conclusions: Participants told us that education settings that foster cultural security benefit Aboriginal children's educational outcomes and mental health and wellbeing. Using the resource contributed to an increase in the importance and confidence of participants to support their child's cultural needs and develop cultural security. Future research should focus on the impact of regular parent/carer-teacher conferences, and parent/carer involvement in school governance (i.e. P&C Committees) on cultural security in education and education outcomes.

Childhood burn injury increases susceptibility to disease by disrupting immunity

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1 Telethon Kids Institute, Northern Entrance, Perth Children's Hospital, 15 Hospital Ave, Nedlands WA, 2 Institute for Respiratory Health, Ground Floor, E Block, Sir Charles Gairdner Hospital, Hospital Avenue, Nedlands WA, 3 Burn injury research unit, School of Biomedical Sciences, University of Western Australia, Crawley, WA, , 4 Fiona Wood Foundation, 11 Robin Warren Dr, Murdoch WA, 5 Burns Service of Western Australia, WA Department of Health, WA

Background and aim: Children that suffer a burn have a reduced life expectancy and are at increased risk of infections, mental health conditions, cardiovascular disease and cancer, long after discharge from hospital for the burn injury itself. Evidence suggests that burn injury induces sustained immune system dysfunction, and we hypothesise this is the cause of increased prevalence of chronic disease in children after a burn. However, we still don't understand the mechanisms that disrupt immunity in response to burn trauma.

Research method: We utilised mouse models of burn injury, cancer and infection to investigate the link between burns and cancer and better understand the specific impact burn injury has on the immune system.

Results: We have demonstrated that mice subjected to a non-severe (8% total body surface area), full-thickness burn injury one month earlier were significantly more susceptible to tumour development than controls in a semi-penetrant model of B16 melanoma. Tumour development in this model is controlled by the immune system, indicating immune dysfunction is the cause of this. To investigate this immune dysfunction in more detail, we tracked T cell responses using a mouse model of Herpes Simplex Virus infection and showed that T cell activation and function was reduced in the context of a burn injury.

Conclusions: We have shown that burn injury increases cancer risk in mice and causes long-term changes impacting T cells. This is likely to affect the ability to efficiently mount immune responses and eliminate pathogens, consequently contributing to disease risk in burn patients.

Early Career Research Presentations

Telethon Kids Seminar Room, 3.00 – 4.30pm

Chair: Assoc Prof Ashleigh Lin

The role of mesenchymal stem cells during leukaemia development

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Background and aim: Acute lymphoblastic leukaemia (ALL) is the most prevalent childhood cancer. Certain high-risk genetic subtypes of this disease, such as those with the BCR-ABL1 fusion gene, have a dismal prognosis and therefore, further research is required to identify more effective and less toxic therapies. The bone marrow microenvironment (BMM) is known to regulate haematopoiesis and contribute to leukaemogenesis. Hence, is an attractive therapeutic target. Mesenchymal stem cells (MSCs) are considered one of the most important cell types in the BMM. To date, little is known about how leukaemia cells alter MSCs and how MSCs contribute to disease development in lymphoid malignancies. This project aims to identify the role of MSCs during leukaemia development and provide novel insight into the complex regulatory networks of the leukaemia microenvironment

Research method: This project uses a well-established syngeneic mouse model of BCR-ABL1+ pre-B cell ALL which recapitulates the leukemia BMM found in paediatric patients. Using *in vitro* assays and RNA sequencing, we aim to identify any cellular and molecular level changes occurring in the MSC population in the leukaemia BMM that may be facilitating disease progression or hindering healthy haematopoiesis.

Results: Preliminary results suggest that MSCs harvested from a healthy microenvironment impede the growth of leukaemia cells *in vitro* and early experiments have identified alterations in the proliferation potential of MSCs harvested from the leukaemia microenvironment.

Conclusions: These results provide a promising indication that the MSC population is capable of modulating leukaemia cell growth and that there are changes occurring in the MSC population as a result of leukaemia development in the BMM warranting further investigation.

Are epithelial cell cytokines associated with atopic dermatitis during infancy?

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1 Telethon Kids Institute, 2 The University of Western Australia, 3 Perth Children's Hospital, 4 InVIVO Planetary Health

Background and aim: Early onset of atopic dermatitis (AD) in infancy typically precedes the development of other atopic diseases. Epithelial cell (EC) cytokine expression patterns may be a potential biomarker in early life to target allergy prevention strategies towards 'at-risk' infants.

This investigation aimed to examine associations between circulating levels of EC cytokines (thymic stromal lymphopoietin (TSLP), interleukin (IL)-33, and IL-25) and infant AD.

Research method: We collected cord blood (n=31) from atopic mothers and followed up their infants at 4-6 and 12 months of age for collection of blood samples and diagnosis of AD. We also measured EC cytokines in blood samples collected at 4-6 months of age in an additional 60 infants with and without early onset AD. TSLP concentration was measured by enzyme-linked immunosorbent assay (ELISA) after acetone precipitation of the samples. IL-33 and IL-25 were measured by Luminex.

Results: Early onset of AD was associated with higher levels of EC cytokines at 4-6 months of age. From the longitudinal investigation of 31 mother-infant pairs, we found infants who developed AD had lower levels of IL-33 and IL-25 at birth compared to infants who did not develop AD during infancy (first 12 month-of-life).

Conclusions: This study found that higher levels of EC cytokines at 4-6 months of age are associated with early onset AD. However, we also discovered that lower cord blood levels of IL-33 and IL-25 were associated with AD during infancy. Hence the timing of measurement of EC cytokines may be critical in targeting these cytokine pathways for the prevention of AD.

Validation of a well-accepted method for SARS-CoV-2 paediatric swabbing through the DETECT Schools Study

Thomas H[1], Mullane M[1], Whelan A[1], Leahy A[1], Barrow T[1], Ang S[1], Padley A[2], Sprigg L[2], Speers D[3], Cross D[1], Gething P[1], Bowen A[1]
(a partnership between the Telethon Kids Institute, CAHS, WACHS, PathWest and the Department of Education)

1 Telethon Kids Institute, 2 CAHS, 3 PathWest

Background: In early 2020 the SARS-CoV-2 virus emerged and shortly thereafter, a global pandemic was declared. In mid-March, WA lockdown restrictions came into effect and schools were closed. The Minister for Health announced the DETECT Schools Study on 1st May to reassure the community as schools reopened for Term 2.

Methods: DETECT Schools aims to quantify and characterise any transmission of SARS-CoV-2 in WA schools by swabbing up to 6,000 students and staff monthly for three months. Concurrent surveys investigate the impact of the pandemic on the wellbeing of school communities. Uncomfortable nasopharyngeal swabs are commonly deployed at COVID testing clinics: these were not deemed appropriate for this study by consumers or study staff. Instead, a combined throat and anterior nares swab with slightly reduced test performance was chosen for comfort, compliance, high throughput, and ease of swabbing.

Results: To date, 13,964 swabs have been collected with 0 testing positive for SARS-CoV-2 and no false positive results found in the low prevalence setting of WA schools. Participants have reported high acceptability, with 71% experiencing no or minimal discomfort.

Conclusions: Our experience supports emerging data that various non-nasopharyngeal samples are appropriate, well received, and efficient for paediatric detection of SARS-CoV-2. The study method combines throat and anterior nose sampling, maximising sensitivity while causing minimal discomfort and thus combating noncompliance rates by significantly increasing the acceptability of testing. Whilst no comparative testing was performed, this testing approach could be repurposed in the event of increased community transmission in WA for rapid COVID-19 detection in other settings.

Pre-clinical cranial radiotherapy as a mouse model of neurological late effects

Lawler J[1,2], Buck J[2,3], Somers K[1,2], Whitehouse J[2.3], Howlett M[2,3], Mehnert A[4], Hii H[2], Carline B[2], Feindel K[4], Ebert M[5], Gottardo N[2,6], and Endersby R[2,3]

1 Faculty of Health and Medical Sciences, University of Western Australia, Perth, 6009, Australia, 2 Brain Tumour Research Program, Telethon Kids Institute, Perth, 6009, Australia, 3 Centre for Child Health Research, University of Western Australia, Perth, 6009, Australia, 4 Centre for Microscopy, Characterisation and Analysis, University of Western Australia, Perth, 6009, Australia, 5 Faculty of Engineering and Mathematical Sciences, Physics, University of Western Australia, Perth, 6009, Australia, 6 Department of Oncology, Perth Children's Hospital, Perth, 6009, Australia

Background and aim: Cranial radiotherapy (RT) in children damages the developing brain, causing significant late side effects in survivors of paediatric brain tumours. Preclinically, the effects of RT on neurodevelopment can be studied in juvenile mice. However, many studies fail to replicate the fractionated delivery of clinical RT, whereby children receive daily fractions of RT. Instead, a "mathematically equivalent" single high dose of RT is often used. The purpose of our study was to determine if a single high dose of RT (8Gy) and its mathematically equivalent fractionated dose (18Gy as 9x2Gy daily fractions) do indeed result in comparable late effects *in vivo*.

Research method: RT or sham treatment was delivered to mouse pups at post-natal day 16, and the mice were raised to adulthood. The brains were harvested, and T_2-weighted MRI scans were performed. The volumes of brain regions were measured using manual segmentation and compared between groups.

Results: Volumetric reduction in the whole brain volume was observed following high dose RT, but not fractionated RT. Regional radio-sensitivity was observed in the hippocampus and cerebellum, which showed reduced volume only in the high dose RT group. The

olfactory bulbs were highly radio-sensitive, with volumetric reduction observed in both high dose and fractionated RT groups.

Conclusions: These data suggest that “mathematically equivalent” fractionated and single high doses of RT do not have biologically similar outcomes on neurodevelopment in mice. As such, preclinical studies aimed at measuring late effects or informing clinical trials should faithfully mimic clinical fractionated RT protocols.

Early life respiratory infections perturb lung function in adulthood

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University of Western Australia, 1 Telethon Kids Institute, 2 Curtin University

Background and aim: Environmental exposures in early-life can alter developmental trajectories and induce long-term changes in physiological function. To address this issue, we developed a mouse model of respiratory viral infection, in which infected neonates have impaired lung function as adults. The aim of this study is to identify virus-induced perturbations to pulmonary gene networks that are linked to developmental and physiological changes.

Research method: BALB/c pups were inoculated with Influenza A/Mem/1/71, Influenza A/PR/1/8 or relevant control at seven days of life. Pups were sacrificed and lung tissue was collected for every treatment group at day 7, 14 and 28 post-infection for RNA-seq analysis. Remaining pups grew to adulthood, when lung function and responsiveness to methacholine (MCh) were assessed.

Results: Prior infection with either Influenza A/PR/1/8 or A/Mem/1/71 resulted in male mice being significantly more responsive to MCh as adults with respect to airway resistance, compared with uninfected controls. Cluster analysis of RNA-Seq profiles demonstrated that PR8 strongly perturbs pulmonary gene expression patterns at seven days’ post-infection, and whilst these changes wane over time, they persist out to day 28 post-infection. Mem71 infection produced a milder perturbation of pulmonary gene expression in comparison to PR8.

Conclusions: We showed that neonatal respiratory viral infection can impact on lung development and ensuing physiological function in adulthood, and this was reflected in the patterns of the underlying gene networks. Our experimental mouse model can be leveraged to understand the molecular mechanisms and principles that link early-life exposures with phenotypic development.

Early Career Research Presentations
The Manda, Telethon Kids Institute, 3.00 – 4.30pm

Chair: Dr Sebastien Malinge

Can we improve aerosol delivery to children computationally?

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1 Telethon Kids Institute, 2 Occupation, Environment and Safety, School of Public Health, Curtin University, Perth, Australia, 3 Medical School, Division of Anesthesiology, University of Western Australia, Perth, Australia, 4 Department of Anaesthesia and Pain Management, Perth Children's Hospital, Perth, Australia, 5 Fluid Dynamics Research Group, School of Civil and Mechanical Engineering, Curtin University, Perth, Australia, 6 Telethon Kids Institute, University of Western Australia

Background and aim: In order to potentially improve aerosol delivery emitted by pressurised metered dose inhaler to paediatric patients using tracheostomy tubes, an *in silico* solid particle computational fluid-particle dynamic model was validated.

Research method: A geometry, designed to mimic a 5 mm paediatric tracheostomy tube was created using Python software and imported into computational fluid-dynamic software, OpenFOAM. Computationally, a single dose of aerosol was injected into the tube at the devices reported speed, superimposed on a paediatric patient inhalation. *In silico*, particles were deemed to deposit in the tube when within a radius width of the tube lumen. The software solved for conservation of momentum, and mass (Navier-Stokes equations), coupled with discrete particle tracking. The Pawsey Supercomputing Centre was used to process the simulation. For validation, deposition in tube was also determined *in vitro*, by measuring solid (drug) aerosol particles with high performance liquid chromatography.

Results: Computational simulation showed 90% of the aerosol will deposit in the tube, and this is dependent on particle-size and flow rate. The simulated result was successfully validated by the laboratory result by matching the mass exiting and within tube within 10%.

Conclusions: Aerosol drug delivery via tracheostomy tube is less than 10% of the intended dose when delivered via pressurised metered dose inhaler alone and can be optimised by methods developed here.

Dense and diverse pneumococcal carriage in Papua New Guinean infants

Britton KJ[1,2], Pickering J[1], Pomat WS[3], deGier C[1,2], Nation M[4], Pell C[4], Granland C[1], Solomon C[3], Greenhill A[5], Richmond PC[1,2], Blyth CC[1,2], Lehmann D[1], Satzke C[6,7], Kirkham L-A[1,8] on behalf of the 10v13vPCV trial team

1 Wesfarmers Centre of Vaccines and Infectious Diseases, Telethon Kids Institute, the University of Western Australia, Perth, Australia; 2 Division of Paediatrics, School of Medicine, the University of Western Australia, Perth, Australia; 3 Papua New Guinea Institute of Medical Research, Goroka, Papua New Guinea; 4 Infection and Immunity, Murdoch Children's Research Institute, Melbourne, Australia; 5 School of Health and Life Sciences, Federation University, Victoria, Australia; 6 Department of Paediatrics, The University of Melbourne, Melbourne, Australia; 7 Department of Microbiology and

Immunology, The University of Melbourne at the Peter Doherty Institute for Infection and Immunity, Melbourne, Australia; 8 Centre for Child Health Research, the University of Western Australia, Perth, Australia

Background and aim: Rates of pneumococcal carriage and disease in Papua New Guinea (PNG) are amongst the highest worldwide. We investigated pneumococcal conjugate vaccine (PCV) impact on pneumococcal carriage diversity and density in infants, prior to national PCV13 roll-out.

Research method: Infants in a PCV trial (PCV10 (n=14) or PCV13 (n=57) at 1-2-3-months of age; 2011-14) were age-matched with unvaccinated infants (n=162; 2013-16). Nasopharyngeal swabs (n=342) were collected at 1-4-9 months of age, and serotype-specific carriage measured by qPCR and microarray.

Results: Pneumococci were present in 94% of swabs, with 59 different serotypes and 5 non-encapsulated variants detected. Multiple serotypes (up to 5) were observed in 43.9% of swabs. Median pneumococcal carriage density was similar in vaccinated (6.96 $\log_{10}$ GE/mL (interquartile range 6.38-7.58)) and unvaccinated infants (7.01 log10 GE/mL (interquartile range 6.30-7.57)). Post-primary schedule vaccine serotype (VT) carriage prevalence was similar in PCV13-vaccinated (40.0%) versus unvaccinated infants (48.1%, p=0.235); and PCV10-vaccinated (25.0%) versus unvaccinated infants (26.4%, p=1.000). Non-VT carriage prevalence was similar in PCV13-vaccinated (81.0%) versus unvaccinated infants (70.8%, p=0.084); and PCV10-vaccinated (83.3%) versus unvaccinated infants (85.8%, p=0.683).

Conclusions: PNG infants experience diverse and dense pneumococcal colonisation irrespective of PCV vaccination. Continued surveillance of national PCV13 impact on carriage is required and alternative immunisation strategies warrant consideration.

Ezrin: a potential biomarker of airway epithelial repair and wheeze morbidity

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1 Wal-yan Respiratory Research Centre, Telethon Kids Institute, Western Australia, Australia, 2 Occupation and Environment, School of Public Health, Curtin University, Western Australia, Australia, 3 Centre for Cell Therapy & Regenerative Medicine, Western Australia, Australia, 4 Department of Respiratory and Sleep Medicine, Perth Children's Hospital, Western Australia, Australia, 5 Division of Paediatrics, Medical School, The University of Western Australia, Western Australia, Australia, 6 Priority Research Centre for Asthma & Respiratory Disease, Hunter Medical Research Institute, New South Wales, Australia, 7 Robinson Research Institute, University of Adelaide, South Australia, Australia

Background and aim: Prior studies have identified a “vulnerable” epithelial endotype, characterised by impaired response to injury, to associate with childhood wheeze leading to asthma. The identification of endotype-specific biomarkers would facilitate the targeted treatment in early life. One candidate protein, ezrin, could be a suitable biomarker of airway epithelial integrity and respiratory morbidity. We hypothesised that systemic levels of ezrin is associated with impaired epithelial repair and wheeze morbidity in young children.

Research method: Airway epithelial cell cultures of children with and without wheeze (n=19) were established and wounding assays were performed to assess repair. Ezrin protein quantification was performed by ELISA in culture supernatant, plasma and urine

samples from children with and without wheeze. The relationship between airway epithelial cells, ezrin and longitudinal clinical outcomes (wheeze recurrence and severity) was assessed using Pearson's correlation.

Results: Ezrin protein was found to be expressed by airway epithelial cells, although reduced in cultures from children with wheeze. Reduced plasma and urine ezrin levels were detected in children with wheeze, particularly those with impaired airway epithelial repair. Importantly, both plasma and urine ezrin levels negatively associated with future recurrence and severity of asthma exacerbations, where children with persistent/severe asthma had the lowest ezrin levels.

Conclusions: Our study highlights ezrin as a potential biomarker of epithelial dysfunction, recurrence and severity of respiratory symptoms in children. Future studies should assess the use of ezrin clinically to identify children with wheeze that may benefit from targeted therapies.

The PATRIC (Pragmatic Adaptive Trial for Respiratory Infections in Children) Registry.

Bhuiyan M[1], Pavlos R[1], Obrien S[2], Doyle S[8], Snelling T[1,6,7], Richmond P[1, 2,3,5], Marsh J[1,5], Jones M[1,6], Martin A[2,5], Borland M[2,5], Blyth C[1,2,4,5].

1 Telethon Kids Institute, 2 Perth Children's Hospital, 3 Child and Adolescent Health Service, 4 PathWest Laboratory Medicine WA, 5 The University of Western Australia, 6 The University of Sydney, 7 Sydney Children's Hospital, 8. What The Doctor Said.

Background and aim: Acute respiratory infections (ARIs) are a common condition presenting to paediatric emergency departments (ED), the leading cause of paediatric hospitalisation in Western Australia and major driver for the excessive use of antibiotics in children.

The PATRIC Registry has been developed to evaluate the effectiveness of clinical care for ARI providing valuable baseline data to inform clinical guidelines and as a platform for clinical trials assessing antimicrobial interventions, immunomodulatory interventions, and supportive care interventions.

Research method: Any child presenting to Perth Children's Hospital (PCH) ED with fever and a acute respiratory infection (ARI) is eligible for participation in PATRIC. Using Parent Reported Outcomes and the medical record, the PATRIC Registry collects data on ARI diagnosis, treatment, clinical history, medication prescription and adherence, subsequent healthcare use, symptom resolution and parental anxiety

Results: The PATRIC Registry was launched in the PCH ED in February 2020. From Feb - April 2020, 99 participants were enrolled and 61% completed all surveys until recovery. Nearly 80% of the ARI children were <5 years. The mean recovery from ARI was 8 days (95% CI: 7–10) with 85% children returning to regular activities by 7 days. Of 61 subjects, 25 (41%) received antibiotics.

Conclusions: The PATRIC electronic data collection tools can allow assessment of current treatment practice and surveillance of seasonal ARI severity in real-time. Baseline data shows that the majority of children with outpatient diagnosed ARI recover within a week. The PATRIC Registry provides a platform to for embedding clinical trials on ARI at PCH.

Influenza hospitalisation and vaccination in Australian children: 2010-2019

Norman DA(1,2), Cheng AC(3,4), Macartney KK(5,6,7), Moore HC(1), Danchin M(8,9,10), Seale H(11), McRae J (5,7), Clark JE(12), Marshall HS(13,14,15), Buttery J(16,17), Francis JR(18), Crawford NW(8,10,19), & Blyth CC(1,2,20,21) on behalf of the Paediatric Active Enhanced Disease Surveillance and Influenza Complication Alert Network (FluCAN) Collaboration

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Background and aim: Children with comorbidities are at significantly greater risk of severe influenza outcomes compared to previously healthy children. However, influenza vaccine coverage remains inadequate in both children with and without comorbidities

Research method: Children <17 years old admitted with acute respiratory illness and tested for influenza at sentinel hospitals were prospectively enrolled in to the PAEDS-FluCAN surveillance network. Demographics, comorbidities, and diagnoses were evaluated with multivariable regression to identify predictors of severe outcomes including ICU admission, intubation, hospitalisation length, and mortality. Influenza vaccine effectiveness was estimated using a test-negative design and conditional logistic regression.

Results: Overall, 6057 influenza positive paediatric patients from 2010 to 2019 were enrolled in the PAEDS-FluCAN surveillance network. Influenza A was predominately identified in 69.3% of cases with the remaining being Influenza B. Comorbidities were present in 40.8% of cases, and increase patients' odds of ICU admission, antiviral treatment, respiratory support interventions, longer hospitalisations, and dying. Certain comorbidities including cardiac and neurological conditions increasingly predisposed children to more severe influenza outcomes, as did nosocomial influenza infections. Similar vaccination effectiveness was show in children with and without comorbidities. Vaccine coverage whilst overall suboptimal, was greater in children with comorbidities and increased over time.

Conclusions: Hospitalisation outcomes in influenza positive patients were significantly impacted by their age, comorbidities, and nosocomial influenza. Whilst significant vaccine effectiveness was demonstrated for all children, low coverage remains an issue despite national funding schemes. Increasing influenza vaccination in all children would reduce severe paediatric influenza outcomes.

Networking and Telethon Kids Institute Awards Sundowner

The Manda,Telethon Kids Institute, 5.00 – 6.00pm

Oral Abstracts
Wednesday 4 November

Concurrent Oral Presentations Session 1

Creating Clinical Impact

PCH Auditorium, 1.00 – 2.30pm

Chair: Julien Graciet (CAHS, A/Head of Physiotherapy)

Toddler's Fracture Immobilisation (ToFI) Study

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Background and aim: Management of common childhood spiral tibial fractures, known as toddler's fractures, has not significantly changed in recent times despite the availability of immobilisation devices known as controlled ankle motion (CAM) boots. We compared standard therapy with these devices to demonstrate improved quality of life measures.

Research method: A prospective randomised control trial, comparing immobilisation with an above knee POP (AK-POP) with CAM boot in children aged 1-5 years with proven or suspected toddler's fractures presenting to a tertiary paediatric emergency department. A care and comfort questionnaire (CCQ) assessing activities of daily living (ADL) and pain scores were performed at 5 time-points throughout the study.

Results: Between March 2018 and February 2020, 87 patients were randomised, (44 CAM boot, 43 AK-POP). A significant difference was demonstrated on day 2 in Personal Care

CCQ (PC-CCQ); mean difference 1.36 (95% CI 0.8, 1.93) p<0.001 and Positioning CCQ (P-CCQ); mean difference 1.56 (95% CI 0.9, 2.17) p<0.001 between CAM boot and AK-POP respectively. This significance was repeated at 7-10 days, PC-CCQ: mean difference 1.89 (95% CI 1.4, 2.39) p<0.001 and P-CCQ: mean difference 1.41 (95% CI 0.9, 1.92) p<0.001 with a difference in weight-bearing status (77.5% CAM vs 53.8% AK-POP, p=0.027).). There was no difference in fracture healing or pressure areas. At 6 weeks post injury a significant number in AK-POP had an abnormal gait (22.2% vs 3.3%, p=.0033).

Conclusions: Immobilisation of toddler's fractures in a CAM boot allows faster return to ADL and weight-bearing without any effect on fracture healing.

Consensus statement to prevent respiratory illness in children with cerebral palsy

Gibson N[1], Blackmore AM[2], Langdon K[1], Cooper MS[3], Chang A[4], Jaffe A[5], Kong W[6], Moshovis L[2], Wilson AC[1]

1 Child and Adolescent Health Service, 2 Ability Centre, Mount Lawley WA, 3 Royal Children's Hospital, Melbourne, 4 Queensland Children's Hospital, Brisbane, 5 Sydney Children's Hospital, Randwick, 6 Women's and Children's Hospital, Adelaide

Background and aim: Respiratory illness is a major cause of hospital admissions in young people with cerebral palsy (CP), but there is little good quality evidence on how to prevent or manage it. We describe the process for developing a consensus statement of recommendations to optimise respiratory health in children with CP.

Research method: We used a Delphi method to develop expert consensus statements where published evidence was lacking. Experts (clinicians or academics with at least 10 years' experience working with children with CP at risk of respiratory illness) participated in a three-round Delphi survey. Round 1 consisted of open-ended questions to generate recommendations to prevent and treat respiratory illness in CP. In rounds 2 and 3, participants indicated their levels of agreement with these recommendations on a 7-point scale. Consensus was set at 85% agreement. After round 3, consumers contributed to the consensus. The final document combined the evidence from a systematic review with the Delphi consensus.

Results: 106 experts with a mean of 17.9 years (SD 6.95) of experience in the field identified 122 best practice statements in round 1. These statements crossed the domains of assessment, prevention and treatment. By the end of round 3, 80 recommendations/statements reached consensus and were retained. Gaps in evidence were highlighted by the process.

Conclusions: The best practice consensus statement for the general principles of respiratory care for children with CP is now published. These recommendations are intended for use by the wide range of practitioners who care for individuals living with CP.

Culturally informed healthcare transforms lung health for Aboriginal children

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Background: Chronic wet cough in children is the hallmark symptom of protracted bacterial bronchitis (PBB) and if left untreated can lead to bronchiectasis. Bronchiectasis is prevalent in Indigenous populations, but diagnosis is often delayed due to under-recognition of chronic wet cough. Our aim was to use knowledge translation (KT) methods to improve recognition and management of chronic wet cough.

Methods: A mixed-methods, KT study (Feb 2017-Aug 2019) in a large remote town and Aboriginal medical service, which included:

1. Culturally appropriate knowledge dissemination to facilitate family health seeking for chronic wet cough in children (including advertising and community presentations).
2. An implementation strategy to facilitate correct diagnosis and management of PBB by clinicians (including training; information flip chart; updated, easy to access guidelines and systems to facilitate patient follow-up).

Results: The number of children presenting to primary medical care for chronic wet cough in the 6-month period following KT (post=23/636,3.6%) almost tripled compared to the number of children presenting in the prior 6-months (pre=8/630 (1·3%) p=0·007). Clinician proficiency in management of chronic wet cough also improved significantly following KT, reflected by (i) improved parent-proxy chronic cough quality of life (QoL) in children with chronic wet cough, (p<0.001) (ii) improved clinician assessment of cough quality (p=0·026), duration (p=0.001) and appropriate antibiotic prescription (p<0·001).

Conclusion: Health seeking for children with chronic wet cough can be facilitated through provision of culturally appropriate health information. Clinician proficiency in the management of chronic wet cough can be improved with KT, leading to better health outcomes.

Tramadol chocolate oral formulation: acceptability and tolerability

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Background and aim: The bitter taste of medications and difficulty in swallowing tablets can contribute to treatment failure in children. Tramadol is a bitter drug which causes fewer side effects such as respiratory depression and constipation compared to opioids. However, no

licensed paediatric tramadol formulation is available. The aim of this study was to trial a tramadol formulation using a chocolate delivery system to determine tolerability and acceptability.

Research method: A novel paediatric chocolate-based drug delivery system (CDS) tablet containing tramadol was formulated and trialled in a pilot, single-centre, open-label, randomised clinical study with 137 children aged 3-16 years at Perth Children's Hospital. A 5-point facial hedonic scale was used by the child, parent and nurse to assess tolerability. Patients and parents were also asked if they would be happy to take the drug again if required.

Results: This study assessed tolerability and safety of the tramadol CDS tablet using compounded tramadol oral suspension as a comparator at a dose of 1 mg/kg^{-1}. The tramadol CDS had significantly improved scoring compared with the oral comparator on the 5-point facial hedonic scale ($p<0.001$). Younger children (3-6 years, n=30) preferred the CDS tramadol more than mature children (7-17 years, n=35) ($p=0.005$). Seventy eight percent of children from the chocolate group indicated that they would take the same formulation again compared to 35% of children from the comparator group.

Conclusions: The novel chocolate tramadol tablets had favourable tolerability and acceptability.

Keywords: Tramadol, formulation, RCT

Development and Validation of a Screening Instrument to Predict Aggressive Behaviour in the Hospital Setting: The BRACHA Initiative

Mancini VO [1,2,3], Davies S [1], Child and Adolescent Health Service Sub-Committee[1]

1 Child and Adolescent Health Service (CAHS), 2 Complex ADHD Service, Child and Adolescent Health Service, 3 Telethon Kids Institute.

Background and Aim: The National Safety and Quality Health Service Standards (NSQHSS) provide a number of action items designed to protect the public from harm and to improve National Health Service provision. The *Comprehensive Care Standard* includes action items directed at *predicting, preventing, and managing aggression and violence.* The ability to accurately and consistently predict patient aggression and violence requires precision screening instruments. One promising instrument previously piloted in a North American sample is the Brief Rating of Aggression by Children and Adolescents (BRACHA). However, it is not yet clear whether the BRACHA (or any other measure) has suitability for the West Australian hospital setting.

Research Method: This joint collaboration with experts at Cincinnati Children's Hospital and the University of New South Wales will begin by validating the BRACHA for use in a West Australian context. The subsequent direction of the project will be informed by preliminary research findings and through stakeholder engagement to ensure that the final instrument is one that not only demonstrates good psychometric properties, but also has good clinical utility.

Anticipated Results: This broader project is comprised of a series of smaller aims will establish the suitability of the BRACHA for the West Australian hospital setting. Through

collaboration with stakeholders and content experts, we will validate a fit-for-purpose instrument that can aid in the prediction and prevention of aggressive behaviour.

Implications: The ability to accurately and consistently predict aggression and violence will enable healthcare providers to enact de-escalation procedures that will maximise patient safety.

Utility of Bedside Ultrasonography in realignment of Forearm Fractures at Paediatric Emergency Setting

Hogan J[1], Tie SW[2], Green S[3]

1 Child and Adolescent Health Service, 2 Child and Adolescent Health Service, 3 Child and Adolescent Health Service

Background and aim: Portable fluoroscopy (PF) is the gold standard practice for fracture manipulation and closed reduction. However, it poses ionising radiation (IR) exposures to users. Ultrasound (US) is increasingly available in the Emergency Department (ED) and we hypothesised that bedside US during realignment of selected forearm fractures in ED could safely reduce need for PF.

Research method: We undertook a retrospective review of all ultrasound-guided manipulation and closed reduction (UGMCR) for distal and mid forearm fractures (DMFF) performed in a tertiary paediatric ED over 3.5 years. Patients with forearm fractures were identified and their medical files reviewed to record the incidence of failed UGMCR, repeat MCR, shift of fractures and unscheduled cast changes. We also determined the medications used during the manipulation (intravenous ketamine (iK) or intranasal fentanyl with nitrous oxide(iFAN) to compare the ED length of stay (LOS).

Results: There were 174 cases identified with 167 completing follow up to discharge from orthopaedic follow-up. The percentage of failed UGMCR in ED, repeat MCR ≥ 1 week later, shift of fractures ≥ 1 week later, and any unscheduled cast change were 3.4% (6/174), 5.4% (9/167), 12.6% (22/167), and 7.8% (13/167) respectively. The median ED LOS for iK versus iFAN was 4.9 hours versus 3.1 hours with 81.6% receiving iFAN.

Conclusions: UGMCR in selected suitable cases undertaken in the ED setting was effective and demonstrated a shorter ED LOS when iFAN was used for sedation. A structured guideline and learning module has the potential to reduce healthcare costs through improvement in ED patient flow and reduction in the orthopaedic input.

Child & Adolescent Community Health Showcase

Telethon Kids Seminar Room, 1.00 – 2.30pm

Chair: Dr Meredith Green (CAHS Community Health, Senior Coordinator Information and Performance)

Current research context in Community Health

Deborah Flynn and Terri Barrett, Community Health Co-Directors

Community Health study showcases:

Assessment of psychosocial wellbeing for students transitioning to secondary school
Dr Ailsa Munns

The Child Development Service ADHD Clinical Care Pathway
Dr Rona Kelly

Identifying risk factors that predict developmental delay at 2 years
Karen Forde

Clinical effectiveness and business feasibility of providing online therapeutic information to parents of children with communication difficulties
Dr Chris Lewis

Measuring parent and child outcomes in the Child Development Service
Dr Jodie Armstrong and Karen Nitsche

Closing
Roundtable discussions about potential research opportunities and partnerships that can strengthen the health and well-being of children across Perth. These discussions will cover:

How can the tools and technology of virtual care be used to measure, monitor, treat and intervene in childhood developmental delays and disorders?

What increased role could Community Health take to effectively support and promote the mental well-being of primary school children?

What strategies are successful and feasible at engaging hard to reach clients in our child development and nursing services?

Moort Maat-bidi (family journey) & The First 100 days: How would you evaluate a program using the social and emotional wellbeing framework?

Supporting Healthy Lifestyle Behaviours & Environments
The Manda, Telethon Kids Institute, 1.00 – 2.30pm

Chair: Professor Catherine Elliott (Telethon Kids Institute, Director of Research)

Passive consent: A method of recruiting more representative survey samples

Gething, P [1], Bowen, A. [1,2], Zubrik, S [1], Mitrou, F. [1], Lombardi, K [1], Epstein, M[3], Mandzufas, J[1], Cross, D[1]

1 Telethon Kids Institute, 2 Child and Adolescent Health Service , 3 Cancer Council of Western Australia

Background and aim: While the NHMRC Statement on Ethical Conduct in Human Research makes no distinction between passive and active consent for surveys, Australian

Departments of Education prefer active 'opt-in' parental consent. Active consent samples are unlikely to represent the population, with parents who are single, of a lower socioeconomic status, or have English as a second language less likely to respond. The wellbeing survey data collected in the DETECT Schools Study utilises passive 'opt-out' consent, ensuring inclusion of a representative sample of Western Australian (WA) children.

Research method: A partnership between the Telethon Kids Institute and the WA Departments of Health and Education, the DETECT Schools Study is a prospective observational cohort surveillance study investigating the incidence, transmission, and impact of SARS-CoV-2 in WA schools. The study employs student surveys to understand the wellbeing of school students considering the ongoing COVID-19 pandemic. In this study, parents were given the option to complete an 'opt-out' form, rather than provide active consent for their children's participation.

Results: Surveys were completed by 23,196 students in June/July 2020. In 79 participating schools, only 8% of students were opted-out: leading to a consent rate of 92%. The usual response rate in Australian school research is 25-30%. The sample includes representation from Aboriginal students, diverse family structures and those from regional areas.

Conclusions: Employment of a passive consent structure led to high participation rates and increased representation of students from diverse backgrounds in the DETECT Schools Study. This valuable method should be considered for future research.

High intensity interval training in an aquatic environment does not increase pain in adolescents with cerebral palsy.

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1 Child and Adolescent Health Service, Perth Children's Hospital, 2 Curtin University

Background and aim: Exercise on land for children with cerebral palsy (CP) is often limited in intensity and duration due to musculoskeletal pain. Pain was measured as a secondary outcome of a feasibility study to determine if high intensity interval training (HIIT) in an aquatic environment, causes, exacerbates or decreases existing musculoskeletal pain in children with CP.

Research method: Design: Randomised controlled feasibility study.
Twelve children with CP who could walk unaided but may choose to use aids in some circumstances (7 males; mean age 14 years 0 months, SD 1 year 9 months) were randomised to either aquatic HIIT (N=6), or control (N=6). Intervention consisted of two sessions of aquatic HIIT for 10 weeks. Presence and impact of pain pre and post intervention was assessed with the Modified Brief Pain Inventory and Bath Adolescent Pain Questionnaire (BAPQ)

Results: Eight of the 12 children had pain at baseline. There was no increase in any pain scores after the intervention compared to the control. There was a decrease in pain in the treatment group. Mean change (SD) in pain sources treatment=–1.17 (0.75); control=0.17 (0.41); Mean (SD) change for pain frequency treatment=–1.17 (1); control=–0.17 (0.58); Mean (SD) change for BAPQ treatment=0 (1.89); control=0.33 (0.41). For the 6 participants in the intervention group, there were 24 reports of pain immediately before aquatic HIIT sessions. Pain either improved or stayed the same in 22/24 immediately post.

Conclusions: Adolescents with cerebral palsy can exercise at high intensities in an aquatic environment without exacerbating pain.

Evidence-based practice and practice-based evidence: lessons learned from the PLAYCE Policy Project

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1 Telethon Kids Institute, 2 The University of Western Australia

Background and aim: Engaging with stakeholders (i.e. people or organisations with a common interest) is an important two-way relationship for researchers looking to implement sustainable public health interventions. It involves the effective use of research evidence combined with information from the specific context of stakeholders' practical experience, across all project stages. The aim of this presentation is to summarise lessons learned on how to successfully engage with stakeholders, from the perspective of both researchers and practitioners involved in the PLAYCE Policy Project.

Research method: The PLAYCE Policy Project is an NHMRC-funded partnership grant that is developing, implementing, and evaluating an evidence-informed physical activity policy for early childhood education and care settings. It involves an international team of 28 researchers and practitioners at present, as well as a consumer group. Using the PLAYCE Policy Project as a real-life case study, structured interviews were conducted with a researcher and practitioner on the process and motivations for being involved in the research project.

Results & Conclusions: Key themes/learnings from the structured interviews will be presented, along with practical tips. Benefits of this two-way process for researchers and stakeholders include long-term partnerships based on open communication and trust.

The impact a Mediterranean Diet in pregnancy on neonatal body fat composition: The ORIGINS cohort

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Introduction: Maternal diet during pregnancy has long-since been recognized as an important determinant of neonatal outcomes and child development. Infant body fat composition is a potentially modifiable risk factor for predicting future health and metabolic disease. Currently no studies have specifically looked at the Mediterranean Diet (MD) in pregnancy as an intervention to reduce childhood obesity.

Aim: To determine if a predominately MD affects the body composition of newborn babies

Method: Utilizing the Mediterranean Diet Score (MDS), this study focuses on how different levels of MD adherence (MDA) in pregnancy influences body fat composition of the infant. Information on 591 pregnant women and their infants were obtained from three datasets within The ORIGINS Project. These datasets included the MDA score, body composition

measurement using infant Air Displacement Plethysmography (PEA POD), pregnancy and birth information.

Results: At time of enrolment, low or high adherence to a Mediterranean diet was seen in 37% and 12% of participants respectively. Babies born to mothers who had high MDA at time of enrolment early in their pregnancy presented on average with 1.4% less fat mass compared to those with low MDA (p=0.027). Similarly, babies born to mothers who had high MDA in their third trimester of pregnancy presented on average with 2.2 % less fat mass when measured within 5 days post-birth compared to those with low MDA (p=0.021).

Conclusion: Pregnancy presents a window of opportunity for healthcare professionals to intervene and improve the health of both mother and child. This study suggests that an infant's body fat composition can be influenced by adjusting the maternal diet. Further studies will be important in examining whether these small but significant changes at birth will set the trajectory for more significant changes in the child's future health and development.

Fit for Play: Integrating physical activity into children's mental health recovery

Fortnum, K.[1,2], Jackson, B.[1], Reid, S.[1], Furzer, B.[1], Elliott, C.[3, 4], Wong, J.[2,3,5], Davies, S.[2]

1 School of Human Science (Exercise Science), University of Western Australia, 2 Child and Adolescent Mental Health Service, 3 Telethon Kids Institute, 4 School of Occupational Therapy, Curtin University, 5 Centre & Discipline of Child and Adolescent Psychiatry, Psychosomatics and Psychotherapy; Faculty of Health and Medical Sciences, University of Western Australia

Background and aim: Children with mental health disorders experience difficulties engaging in group-based physical activity, often displaying lower physical activity levels than children without mental health disorders. Participation is potentially impacted by children's motivation and confidence towards engaging in those forms of physical activity, and their capacity to successfully interact with peers. Fit for Play is a physical-activity program designed to provide supportive physical activity opportunities, focussing on improving children's motivation and confidence towards physical activity participation, and social skills. To determine the program's appropriateness and efficacy, a feasibility study was conducted within the Pathways therapeutic day program (CAMHS).

Research method: Fit for Play comprised 3x30minute sessions/week for 10-weeks. Additionally, parents/guardians received an education session designed to support community/home-based physical activity participation. Semi-structured interviews were conducted with participating children (n=14), parents/guardians (n=5), and staff (n=13) to obtain their perspectives of Fit for Play (e.g., satisfaction, suggestions for improvement, observable outcomes). Thematic analysis was applied to answer the research aims.

Results: All participants advocated for the inclusion of Fit for Play at Pathways, reflecting improvements in children's motivation, confidence, motor proficiency, and capacity to successfully engage in group activities. Staff reported that children were better able to access Pathways treatment. Following the education session, parents/guardians felt enabled to support their child's engagement in physical activity. Staff indicated that to obtain maximum benefits of Fit for Play, it should be facilitated by a movement specialist

Conclusions: A physical-activity-based program can be feasibly implemented into paediatric community-based mental health services, whilst complementing existing therapies

Cystic Fibrosis and Family Surfing Program: A Pilot Study

White, J[1], Starke, K[2], Marsh,J[3], Boehm, T[4], Schultz, A[1]

1 Perth Children's Hospital, 2 Go Surf, 3 Telethon Kids Institute, 4 Monash University

Background and aim: Cystic Fibrosis can cause emotional stress and be a physical burden on families. Physical activity in natural environments can have a beneficial effect on physical and psychological health. Surfing is a playful, ocean-based activity that may benefit patients with Cystic Fibrosis. Family-based interventions built around surfing may potentially facilitate the positive physical and psychological wellbeing of families with Cystic Fibrosis
Aims:

1. To assess the feasibility of innovative family activity interventions built around surfing for families with children with CF
2. Compare surfing with another outdoor activity, golfing, and no intervention

Research method: A randomised, controlled, parallel group pilot study with 15 families of children with CF Comparison of 3 groups: surfing (intervention), golfing (comparison), waitlist control 15 x 1 hour lessons over 7 weeks, outcome measures pre, post and 3 months after intervention

Results: 9/10 families completed intervention, trend of reduction in mother stress and improvement in emotional state of patient with CF, no change in $FEV_{1;}$;qualitative data positive changes in family relationships. Importance of instructor-family relationship; Productive coughing observed in ocean.

Conclusions: Family activity interventions appear to be feasible and beneficial for families of children with CF. Trend of positive impact on family relationships and emotions, families preferred surfing over golfing. Surfing in the ocean can assist in clearing mucus from the lungs.

Oral Presentations Session 2

Early-mid Career Research Presentations

Telethon Kids Institute 'The Manda', 3.00 – 4.30pm

Chair: Assoc Prof Sarah Cherian (CAHS, Head of Refugee Health)

Closed loop system on glycaemic outcomes in adolescents with Type 1 diabetes in a clinical trial

Mary B. Abraham[1-3], Martin deBock[1-3], Grant J Smith[1], Julie Dart[1,2], Janice M. Fairchild[4], Bruce R. King[5], Geoffrey R. Ambler[6], Fergus J Cameron[7], Sybil A McAuley[8], Anthony Keech[9], Alicia Jenkins[9], Elizabeth A. Davis [1-3],David O'Neal[8], Timothy W. Jones [1-3] on behalf of JDRF Australia HCL study group

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Division of Paediatrics, within the Medical School, The University of Western Australia, Perth, 4 Department of Endocrinology and Diabetes, Women's and Children's Hospital, Adelaide, 5 Department of Endocrinology and Diabetes, John Hunter Children's Hospital, Newcastle, 6 Institute of Endocrinology and Diabetes, The Children's Hospital at Westmead, The University of Sydney, Sydney, 7 Department of Endocrinology and Diabetes, Royal Children's Hospital, Melbourne, 8 Department of Diabetes and Endocrinology, St Vincent's Hospital, Melbourne, 9 University of Sydney, NHMRC Clinical Trials Centre

Background and Aim: In short-term observational studies, hybrid closed loop (HCL) has improved glycaemic outcomes in adolescents with Type 1 diabetes (T1D); however the efficacy of the system has not yet been established in a long-term randomised clinical trial (RCT) setting.

Methods: In a 6-month multicentre RCT, adolescents with T1D were randomly assigned to either of the two groups: a control arm on standard therapy (insulin pump or injections with or without continuous glucose monitoring (CGM)) or an intervention arm on Medtronic 670G HCL system.

Results In an intent-to-treat analysis of 135 subjects [(mean ± SD) age 15.3 ± 3.1 years, diabetes duration 7.7 ± 4.3 years, HbA1c 8.0 ± 1.0%, 81% pump, 53% CGM)], 68 were randomised to control and 67 to HCL. Time in range (TIR) increased from 53.2 ± 13.0% at baseline to 62.5 ± 12.0% at study end in HCL group and from 54.6 ± 12.6% to 56.1 ± 12.2% in control group with a mean adjusted difference of 6.7% [95% CI 3.0, 10.4]; p =0.001). HCL also reduced hypoglycaemia and glycaemic variability (% time < 3 mmol/l: 1.9 ± 2.6 vs 0.7 ± 0.9; p <0.0001 and coefficient of variation: 41% vs 38%; p = 0.02). HCL group had lower HbA1c at study end (Median [IQR]: 7.5 [7.1, 8.0] vs 7.3 [6.9, 7.7] %; p = 0.038). There were no device-related serious adverse events.

Conclusion: HCL significantly improves TIR and reduces hypoglycaemia and glycaemic variability compared with standard therapy in adolescents with T1D.

Factors associated with developmental vulnerability in Aboriginal and Torres Strait Islander children who were born preterm in Western Australia.

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Background: Preterm birth is the highest cause of death and disability in children up to five years of age in the developed world. Australian Aboriginal and Torres Strait Islander (Aboriginal) children have a higher risk of being born preterm and of having developmental vulnerability compared to non-Aboriginal children.

Aims: To identify factors that are associated with developmental vulnerability in Aboriginal children who were born preterm in Western Australian (WA) and completed the 2009 or 2012 Australian Early Development Census (AEDC).

Methods: A prospective population-based cohort study of preterm Aboriginal children (n=375) born in WA was conducted using linked data sets of the children, their mothers and

siblings to the AEDC. AEDC collects data on five developmental domains at 5 years of age. Vulnerability summary indicators were linked to determine which socio-economic factors were associated with developmental vulnerability. Multivariable regression models were constructed to determine which risk factors were significant and relative risks and 95% confidence intervals were calculated.

Results:
In WA in 2009 and 2012, 46% (137/297) of the preterm Aboriginal children who completed the AEDC, had two or more developmental vulnerabilities. The highest vulnerability was noted in the language/cognitive skills sub domain at 38% (142/375). Factors associated with increased developmental vulnerability included maternal mental health contact (aRR 1.50 (1.16-1.93) p-value 0.002) and two or more hospitalisations (aRR 1.58 (1.11-2.24) p-value 0.012).

Conclusions: This study identifies risk factors associated with developmental vulnerability in Aboriginal preterm children which can be used to guide policy and clinical practice.

Key words: Preterm, Aboriginal, Developmental vulnerability

Increasing incidence and severity of anaphylaxis in very early childhood

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Background and aim: Anaphylaxis in very early childhood is an emerging risk. However, data on its incidence, comorbidities, clinical presentation, and management is lacking. The aim of this study was to investigate trends in the frequency and characteristics of anaphylaxis in early childhood and assess for possible change in recognition, features, and management over time.

Research method: We conducted a retrospective chart review of patients aged <2 years with an emergency department diagnostic code of anaphylaxis during two periods (2003-2007; 2013-2017). In confirmed cases, demographics, comorbidities, triggers, symptoms, and management were recorded. Analysis performed using chi-squared, z-tests and generalised linear regression.

Results: A 1.8-fold (98/236,217 versus 167/331,378, *P*<0.001) rise in cases with confirmed anaphylaxis was seen between the two periods, with a greater increase in those age <1 (1.9-fold; *P*<0.001). The odds of moderate/severe anaphylaxis was 123% higher in 2013-2017 (OR 2.23, 95% CI: 1.15 to 4.33). Anaphylaxis recognition was higher in period 2 (*P* = 0.019). Comorbidities, triggers, and symptoms were not different over time. Considering the total group, the leading trigger was food (92.9%), and predominant symptoms were urticaria (85.8%), angioedema (67.8%), and vomiting (42.3%). Cofactors were atopic dermatitis (56.1%), food allergy (43.5%), wheeze (13.8%), and intercurrent illness (18.8%).

Conclusions: This study provides the first alarming evidence that not only is the incidence of anaphylaxis in very early childhood increasing but potentially also the severity. Physicians

and caregivers need to be aware of specific characteristics in this vulnerable nonverbal age group to provide optimal recognition, management, and outcome. Further large-scale studies are warranted to support these findings.

Outcome for acute leukaemia is influenced by ethnicity and geography in Australia

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Background and aim: There is documented variation regarding presenting clinical features, biology, and outcome for childhood leukaemia according to different ethnic, geographical and socioeconomic groups. Little is known about the impact of ethnicity and geographical distribution on survival rates for childhood leukaemia in Australia. To compare disease presentation and outcome in Aboriginal and non-Aboriginal children with acute leukaemia and to assess the impact of remoteness and area-based socioeconomic disadvantage.

Research method: A retrospective review of children (0-18 years) treated for acute leukaemia in Western Australia (WA), South Australia (SA), and Northern Territory (NT) between January 1 2009 and December 31 2018. Data collated included demographic characteristics, Indigenous status, presenting clinical features, disease-risk stratification, treatment regimen and outcome.

Results: Of the 455 children treated for acute leukaemia, remote/very remote localities showed inferior survival outcomes (p=0.004). Five-year overall survival was 91.7% (95% CI 87.9%-94.3%) for children with acute lymphoblastic leukaemia (ALL) and 69.8% (56.7%-79.5%) for acute myeloid leukaemia (AML). A large percentage of Aboriginal children from SA/NT were diagnosed with AML compared to others (60.0% vs. 14.4%, p=0.001). A trend towards inferior overall survival was found in Aboriginal children with ALL compared to non-Aboriginal children (82.4% vs. 92.2%, p=0.07). Aboriginal children were less likely to be enrolled on clinical trials (34.5% vs. 53.1%, p=0.03) and were more likely to be lost to follow-up (41.4% vs. 13.2%, p<0.001).

Conclusions: Aboriginal ethnicity and geographic remoteness of residence are adverse prognostic factors for Australian children with leukaemia. Additional strategies are required to ensure improvements in follow-up and survival of these children.

Time spent outdoors in childhood is associated with reduced risk of myopia as an adult

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Background and aim: Myopia (near-sightedness) is an important public health issue. Spending more time outdoors can prevent myopia but the long-term association between this exposure and myopia has not been well characterised.

Research method: The Kidskin Young Adult Myopia Study (KYAMS) was a follow-up of the Kidskin Study, a sun exposure-intervention study of 1776 children aged 6-12 years. Myopia status was assessed in KYAMS participants (aged 25-30 years) and several subjective and objective measures of time spent outdoors were collected in childhood (8-12 years) and adulthood. A confirmatory factor analysis was used to develop index measures of total, childhood and recent time spent outdoors. Logistic regression was used to assess the association between a 0.1-unit change in the time outdoor indices and risk of myopia after adjusting for potential confounders

Results: There were 303 (17.6% of all Kidskin cohort) KYAMS participants. Spending more time outdoors during childhood was associated with reduced risk of myopia in young adulthood (multivariable odds ratio [OR]=0.82, 95% confidence interval [CI]: 0.69, 0.98). Spending more time outdoors in later adolescence and young adulthood was associated with reduced risk of late-onset myopia (≥15 years of age, multivariable OR=0.79, 95% CI: 0.64, 0.98). Being in the lowest (vs the highest) quartile of time spent outdoors was associated with both an approximate doubling in the prevalence of myopia and two hours less time spent outdoors/day.

Conclusions: Spending more time outdoors in both childhood and adolescence was associated with less myopia in young adulthood.

Volume of Gadolinium Enhancement and Successful Repair of the Blood-Brain Barrier in cALD

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Background and aim: Adrenoleukodystrophy (ALD) is caused by mutations within the X-linked *ABCD1* gene resulting in the inability to transport acylated very long chain fatty acids (VLCFA) into the peroxisome for degradation. Up to 40% of boys develop a severe central nervous system demyelinating form, cerebral ALD (cALD), characterized by white matter changes and gadolinium (Gd) enhancement on brain MRI. Gd enhancement indicates blood-

brain-barrier disruption and active inflammation. Hematopoietic cell transplant (HCT) is the only proven therapy to attenuate cALD progression. The elimination of active neuroinflammation in indicated radiographically by resolution of Gd enhancement and is known to correlate to speed of donor neutrophil recovery.

Research method: We developed a method to quantify Gd on MRI and calculate a Gd volume (cm^3). We analysed 66 boys with cALD undergoing HCT for biomarkers, including Gd volume, correlating with early (30 days post-HCT) Gd signal resolution

Results: We found that log Gd volume (cm3) on pre-HCT MRI strongly positively correlated to day 30 Gd resolution (P= .0003) with smaller volume correlating to higher proportion resolved, as did baseline gadolinium intensity score (P = .04), plasma chitotriosidase activity (P= .04), and faster absolute neutrophil count recovery (P= .03). In multivariate analysis, log Gd volume remained superior in determining early Gd resolution (P= .016). Additionally early Gd resolution also correlated with less neurologic progression from baseline to 1 year following HCT (P=.006).

Conclusions: MRI Gd volume may serve as a contributing biomarker to better delineate outcomes and an important metric in comparing therapies in the treatment of cALD

Oral Abstracts

Wednesday 4 November

Lightning talks

PCH Auditorium, 3.00 - 4.30pm

Chairs: Assoc Prof Fenella Gill and Sonia McAlistair

The lightning talks were a highlight of the 2019 Child Health Research Symposium and are five minutes long and limited to three slides for each presentation with two minutes of dedicated question time at the end of each presentation. Speakers are selected from submitted abstracts.

An innovative model for training in chest drain insertion for pneumothorax

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Background: Pneumothorax is a life threatening emergency in neonates with an incidence that varies from 2.6 to 6.7%, depending on gestational age. Training of medical staff in chest-drain insertion for pneumothorax is critical to save lives. The limitations of the animal model (rabbit carcass) for this purpose include difficulty in identifying anatomical landmarks, ethical concerns, cost, potential biohazards, and limited access to such model in peripheral hospitals.

Methods: We have developed a prototype of an innovative model for training in chest-drain insertion using a mannequin with rib cage constructed using a 3D printer. A thick shelf liner covers the rib cage to simulate muscle layer and an overlying thin cloth simulates the skin. The thoracic cavity is filled with foam to simulate lungs. A plastic pouch filled with air

simulates pneumothorax. The feasibility of this model for training was assessed in a study involving consultants (n=10), senior fellows and registrar in neonatology (n=3 each) using a Likert scale scoring.

Results: Feedback showed that 62% (10/16) strongly agreed, and 37% (6/16) agreed to adopt this model for in house and outreach training; 37% (6/16) strongly agreed and 62% (10/16) agreed that this model provided realistic feel and experience during chest-drain insertion.

Conclusion: The encouraging feedback supports further development of this innovative model using professional high quality 3D printing to simulate not only preterm, and term infant, but also the children and adolescent patient population, followed by rigorous testing.

Preschool Autism Therapy: A randomised-controlled trial of communication therapies

Andrew Whitehouse,[1] Katia Haines[1], Leslie Neely[3], Sarah Pillar[1], David Trembath[2], Kandice Varcin[1], Hannah Waddington [4]

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Difficulties with communication and social skills are part of the diagnostic profile of autism spectrum disorder (ASD). Two evidence-based interventions that target social-communication skills are: Paediatric Autism Communication Therapy (PACT) and Joint Attention Symbolic Play Engagement Regulation (JASPER). However, there is significant variability in ASD, and hence the response of children to therapy. The aim of the current clinical trial is to determine which children with ASD benefit the most from JASPER and PACT therapies.

This project will enrol 160 pre-schoolers (aged 1;6 to 3;11 years) with a diagnosis of ASD into an adaptive randomised controlled trial. After baseline assessment, children will be randomised to receive PACT or JASPER intervention for 12 weeks. Clinicians will then rate the child's progress on a Clinical Global Impression Improvement Scale (CGI-I) to determine whether they are a 'fast responder' or a 'slow responder' to the intervention. 'Fast responders' will continue to receive a further 12 week block of their original intervention allocation. 'Slow responders' will be randomised to either continue to receive the same therapy or a more intense delivery of the same therapy for 12 weeks. Participants will be assessed at treatment endpoint and six-months post treatment endpoint.

This study will generate critical data regarding how we best tailor interventions to the cognitive and behavioural characteristics of children with ASD, including how to alter clinical management pathways when an initial therapy is not effective. The outcomes of this trial will be an important first step towards personalised therapy for children with ASD.

Key words: Autism Spectrum Disorder (ASD), preschool, intervention

Omics integration to assess *in vitro* rhinovirus infection in children.

Agudelo-Romero P[1,2], Chandler JD[3], Ling KM[1,2], Sutanto EN[1,2], Jones DP[3], Tirovanzium RM[4], Stick SM[1,2,5,6,7], Garratt LG[1,2], Kicic A[1,2,5,6,7,8] on behalf of WAERP[1] & AREST CF[1,2,7,9,10,11].

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Background and aim: Children with cystic fibrosis (CF) typically exhibit prolonged and severe symptoms during rhinovirus (RV) infection compared to healthy children (nCF). Here, we used *in vitro* model of airway epithelial cells (AEC) obtained from children with and without CF to study the host-virus interaction signatures after RV infection through the integration of transcriptomic and metabolomic approaches.

Research method: Cultured AECs from nCF (3.9 ± 1.5 years; n=6) and CF (2.6 ± 1.8 years; n=6; all p.Phe508del/p.Phe508del) were infected with RV for 24 hours, after which supernatants and cells were collected to assess metabolites and transcriptomic profiling. Dual-RNAseq and hydrophilic interaction liquid chromatography (HILIC) coupled to mass spectrometry, were used to identify the differences in transcripts/metabolites and RV viral load produced by AECs post RV infection. Regression models and multivariate analyses were then performed to identify the infection hallmark.

Results: Meta-transcriptomics approach confirmed the RV infections in CF and nCF cultures. Global gene expression analysis of RV infection identified 6-fold more differentially expressed (DE) genes in children with CF; whereas, opposite signature was observed during the metabolome profiling, highlighting different antiviral responses. Additionally, network analysis using pair-wise similarities identified a main role of the metabolites as core of the interactions.

Conclusions: Altogether, findings here indicate a more complex response in children with CF and these differences may occur at post transcriptional level. Although functional analysis is still required, the potential biomarkers identified here could be used to give insight into novel antiviral therapies for this at-risk population.

Developing a prediction model to estimate the true burden of RSV in hospitalised children in Western Australia (WA)

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Background and aim: Respiratory Syncytial Virus (RSV) is a leading cause of morbidity in children but is not a notifiable disease and there is no systematic testing in hospitalised children. Therefore, incidence rates underestimate the true burden. We developed a prediction model to estimate the true burden of RSV-associated hospitalisations in children.

Research method: We used probabilistically linked perinatal, hospital, and laboratory (PathWest) records of 321,825 children born in WA, 2000-2012. We generated a predictive logistic regression model for RSV positivity and applied to all hospitalisations from our population-based cohort. The model predictive performance was determined by a 10-fold cross-validated area under the receiver operating characteristic (AUROC) curve.

Results: From 321,825 hospitalisations, 37,784 were tested for RSV (22.7% positive). Predictors of RSV positivity included younger admission age, male, non-Aboriginal, diagnosis of bronchiolitis, bronchitis and long hospital stay. Our model had good predictive accuracy (AUROC: 0.87). The respective sensitivity, specificity, PPV and NPV were 58.4%, 92.2%, 68.6% and 88.3%. Our model predicted RSV-associated admissions for children <2 years to be 126.5/1000 child-years (95 % CI 120.5-132.9), compared with 94.4/1000 child-years (89.1-99.9) from laboratory-confirmed RSV admissions. The under-ascertainment fraction ranged from 14/1000 child-years for infants <3 months to 32/1000 child-years for children <2 years.

Conclusions: We have successfully developed a prediction model to estimate the true burden of RSV in hospitalised children in WA with a good fit for younger ages and during winter. These estimates can now be used as input parameters in dynamic transmission models to better predict the impact of a prevention measures including maternal vaccination.

Coping with chronic disease: The relationship between stigma and diabetes outcomes

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Background and aim: Type 1 diabetes (T1D) is a lifelong chronic disease that demands constant self-management. Daily self-management tasks include blood sugar monitoring, insulin injections, and carbohydrate counting. Given that these tasks need to be undertaken multiple times a day, and often in public, experiences of stigma could act as a barrier to good self-management. The impact of stigma is likely to be particularly salient during adolescence, due to the importance of peer relationships and social status. Therefore, this study aimed to explore if stigma was related to poorer self-management and glycaemic control in adolescents with T1D. Additionally, this study aimed to explore if maladaptive coping responses could explain these proposed relationships.

Research method: Sixty-one adolescents (aged 12-18 years) completed an online questionnaire, which included questions about their experiences of T1D-related stigma, their self-management, and how they cope with T1D-related stressors.

Results: Using a hierarchical regression to control for covariates, higher levels of stigma were found to be associated with higher HbA1c levels, indicating poorer glycaemic control (p < .013). Further, a simple mediation model revealed an indirect relationship between stigma and self-management, through maladaptive coping responses (p < .011).

Conclusions: These novel findings indicate that stigma is uniquely associated with poorer glycaemic control, and indirectly associated with poorer self-management. These results have important implications for clinical practice, particularly for understanding the psychosocial factors that may contribute to suboptimal glycaemic control. These results also emphasise the importance of adaptive coping skills for reducing T1D-related distress.

Meeting Australian 24-Hour Movement Guidelines is associated with better pre-schooler social-emotional development

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Background and aim: Australian 24-hour movement guidelines for the early years provide recommendations on daily physical activity, sedentary leisure screen time, and sleep for children 0-5 years. We used a large representative sample to examine the association between meeting 24-hour movement guidelines and pre-schooler social-emotional development.

Research method: PLAYCE study data were collected for 1368 children 2-5 years from 122 Perth childcare centres. Centres were recruited based on size and socio-economic status. Physical activity was assessed using 7 day accelerometry. Parent-report screen time and sleep were determined using established items. The Strengths and Difficulties Questionnaire was used to measure social-emotional development.

Results: Only 8% of pre-schoolers met all three 24-hour movement guidelines and 7% met none. Meeting screen time guidelines (compared with none) was associated with a lower overall difficulties score and sub-scale scores, except pro-social behaviour (overall: adjusted mean difference (AMD) -2.39, $p<0.001$; emotional difficulties: AMD 0.56, $p=0.013$; conduct problems: AMD 0.63, $p=0.026$; hyperactivity: AMD 0.76, $p=0.029$; peer problems: AMD 0.75, $p=0.046$). Meeting the sleep guideline vs. none (ADM 1.07, $p=0.029$), as well as meeting all three guidelines vs. none (ADM 1.34, $p=0.033$) was associated with better overall social-emotional development.

Conclusions: The odds of children developing a clinically significant mental health disorder increases by 14-28% for each one point increase in the total difficulties score. Our findings provide stronger evidence for the need for all young children to meet 24-hour movement guidelines and the need for effective scalable integrated interventions targeting multiple movement behaviours, particularly sedentary recreational screen time.

The Effect of SMS-Reminders on Child Health in Parents of Newborns

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Background and aim: Incomplete vaccination in Australia occurs due to vaccine hesitancy, which is driven by multiple factors. Studies analysing the effect of behavioural 'nudges' on vaccine uptake have shown promising results. Although there is some evidence for positively

framed SMS vaccine reminders, evidence is lacking for negatively framed reminders. Negatively framed reminders may be highly effective, but paradoxically can risk increasing vaccine hesitancy. This pilot study aimed to evaluate the effect of negatively framed SMS reminders on hesitancy.

Research method: This single-blinded study enrolled pregnant women from antenatal clinics in King Edward Memorial Hospital, Perth, WA which delivers approximately 6000 higher-risk infants per year. Participants were randomised to receive either a negatively framed SMS reminder warning of the risks of failure to vaccinate, or a sham SMS message unrelated to vaccination, and were asked to complete the short-scale vaccine hesitancy questionnaire before and after the intervention.

Results: This pilot study consented 185 participants in the antenatal period to be recontacted after delivery. Consent to participate was obtained for 61 parents who were asked to complete the hesitancy questionnaires. A total of 56 participants did so and were randomised (29 to negative and 27 to sham SMS), and 42 completed the post-intervention hesitancy survey. Pre and post-SMS questionnaires were compared and a difference in hesitancy between groups was not detected.

Conclusions: The application of behavioural sciences through SMS-reminders has the potential to improve vaccination rates. There are difficulties in engaging with parents of newborns about vaccine hesitancy. Further research is warranted using other approaches to recruitment.

An Aboriginal-led culturally secure approach to enhancing social and emotional wellbeing among Aboriginal young people: The Yawardani Jan-ga ("Horses Helping") Program

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For decades, mainstream mental health services have struggled and largely failed to meet the complex needs of Aboriginal young people. Part of this failure rests in the implementation of programs that do not adequately encapsulate Aboriginal perspectives, engagement processes, delivery methods, or program content. Fundamental questions therefore remain as to what type of services or programs can be introduced to achieve significant positive changes.

This presentation will give an overview of the Yawardani Jan-ga Equine Assisted Learning (EAL) Program - a community-participatory action research program in the Kimberley Region of Western Australia. The program embraces local Aboriginal community members as experts providing support for developing, implementing and assessing the effectiveness of a four-level intervention program for building the social and emotional wellbeing of Aboriginal youth.

The four levels of intervention include: (i) building of a local Aboriginal workforce to support the wellbeing of Aboriginal young people; (ii) developing reciprocal partnerships with local service providers to strengthen the provision of holistic and coordinated care, and increased cultural security among mainstream providers; (iii) validating Indigenous research process and methods so as to increase the acceptability and cultural security of research in

Aboriginal communities; and (iv) the ongoing evaluation and refinement an EAL intervention that builds the evidence base of what does and does not work within an Aboriginal context.

Data collected at all levels will elucidate culturally secure processes and methods of developing evidence-based interventions that recognise and respect the power and knowledge that exist in Aboriginal communities to support young people.

Key words: Cultural security, Aboriginal Social and Emotional Wellbeing, Equine Assisted Learning

Supporting family conversations about alcohol use in adolescence

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Background and aim: Parental supply of alcohol and permissive attitudes to underage drinking are linked to increased adolescent alcohol use. Clear parent-child communication is important because a mismatch between parents' reports and children's understanding of their parents' expectations about alcohol is linked to adolescent drinking. This study aimed to develop and test an intervention to support parental non-permissive approaches to underage drinking, increase parent-child communication on alcohol non-use and decrease parental alcohol supply to children.

Research method: Parents of Year 7 students attending 26 WA secondary schools were invited to participate. Pre- and post-intervention surveys were administered to parents in online and hard-copy format. Schools were randomised to an intervention group (n=13) receiving a combined alcohol/cybersafety intervention (parent website/factsheet, family event and classroom alcohol curriculum) or a control group (n=13) receiving a cybersafety-only intervention (parent cybersafety website/factsheet only).

Results: 838 parents responded at pre-test and 365 parents at post-test. Based on the post-test sample, intervention group parents who accessed the combined resources were twice as likely as those who didn't access them to intend not to allow their child alcohol until they were over 18 years. Control group parents' alcohol intentions did not differ significantly between those who did/did not access the cybersafety intervention suggesting the intervention group's results were due to the additional alcohol content, not to systematic attitudinal differences between parents who do and don't access resources.

Conclusions: The findings suggest school-delivered parent interventions can influence parenting behaviours shown to reduce adolescent alcohol use. Such approaches can support efforts to reduce alcohol-related harms among adolescents.

Parental Understanding of Medication Advice Labels: A Qualitative Study

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Background: Parents' misinterpretation of children's prescription medication labels is a main contributing factor that leads to medication administration errors in paediatric settings.

Aims: To determine parents' understanding regarding the instructions written on paediatric medicine labels, and to identify enablers and barriers that affect their interpretation of these labels.

Research method: English-speaking parents (n=20) of children in post-surgical wards at Perth Children's Hospital were recruited and presented with 13 prescription medication labels. Participants were asked to describe their interpretation of, and preference for each label, as well as comments on what they identified as enhancers or barriers to their understanding. Parents' suggestions were also sought to implement improvements. The semi-structured, audio-recorded interviews were manually transcribed onsite, and transcripts thematically analysed using the Framework method via the NVivo data analysis software.

Results: Four key themes emerged through inductive analysis of the interview transcripts: 1) explicit phrasing of dosing intervals and times were more easily interpreted; 2) the use of simpler and common terminology enhanced understanding of the labels; 3) the addition of specific instructions, such as administration with/without food was perceived to be required by most parents; 4) reformatting multiple instructions (e.g. tapering regimens) in a simplified and more organised manner was identified as an enabler, thought to reduce confusion.

Conclusions: There is a need for standardised guidelines for wording of prescription medication advice labels when dispensing medicines in Australia. Findings from this study can be used to achieve this goal, to be implemented to pharmacy practices to promote safe medication use.

Key words: parental understanding; medication labels; interviews at PCH

Kids Voices: Improving Perioperative Care for Children Undergoing Tonsillectomies

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Background and Aim: Attending hospital is often a large source of anxiety for children, with negative medical experiences during childhood having a significant impact on avoidance behaviours throughout adulthood. Feedback around the hospital experience, including the perioperative experience, is often collected from parents or caregivers; however, consultation with children can also be valuable for quality improvement purposes. We aimed to assess the overall experience of children undergoing tonsillectomy surgery, which is one of the most common paediatric procedures.

Methods: Semi-structured interviews were conducted over the phone with 50 children aged 4 – 16 years who had recently undergone tonsillectomy procedures at Perth Children's Hospital. Interviews were transcribed and data was coded for qualitative analysis.

Results: 80% of children reported experiencing postoperative pain, with 36% stating the pain was severe. 52% of children felt nauseous after surgery and 28% of children vomited. 30% of children felt that they were not given enough information about their surgery, with most wanting to know more about pain/sickness and general information. 46% of children said the best part was the food and drink they were given and 40% liked aspects of the hospital environment. For 34% of children the worst part was the surgical process and for 32% it was the pain/sickness.

Conclusions: Interviewing children directly provided valuable insight into each child's individual context, attitudes, opinions and feelings about their surgical experience. Targeting pain and nausea following tonsillectomy procedures appears to be of particular importance to children, and has the potential to improve the perioperative care.

Key Words: Paediatric**,** Interview, Tonsillectomy

Childhood burn injury increases susceptibility to disease by disrupting immunity

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Background and aim: Children that suffer a burn have a reduced life expectancy and are at increased risk of infections, mental health conditions, cardiovascular disease and cancer, long after discharge from hospital for the burn injury itself. Evidence suggests that burn injury induces sustained immune system dysfunction, and we hypothesise this is the cause of increased prevalence of chronic disease in children after a burn. However, we still don't understand the mechanisms that disrupt immunity in response to burn trauma.

Research method: We utilised mouse models of burn injury, cancer and infection to investigate the link between burns and cancer and better understand the specific impact burn injury has on the immune system.

Results: We have demonstrated that mice subjected to a non-severe (8% total body surface area), full-thickness burn injury one month earlier were significantly more susceptible to tumour development than controls in a semi-penetrant model of B16 melanoma. Tumour development in this model is controlled by the immune system, indicating immune dysfunction is the cause of this. To investigate this immune dysfunction in more detail, we tracked T cell responses using a mouse model of Herpes Simplex Virus infection and showed that T cell activation and function was reduced in the context of a burn injury.

Conclusions: We have shown that burn injury increases cancer risk in mice and causes long-term changes impacting T cells. This is likely to affect the ability to efficiently mount

immune responses and eliminate pathogens, consequently contributing to disease risk in burn patients.

Consumer and Community Showcase

Telethon Kids Seminar Room, 1.00 - 2.30pm

Chair: Anne McKenzie, Telethon Kids Institute, Lead Consumer and Community Involvement

The showcase will highlight the valuable role of consumer and community involvement in research across Telethon Kids Institute and the Child and Adolescent Health Service with the following presentations:

Community Advisory Group for COVID-19 research
Presented by Anne McKenzie together with community members, about the experience and necessity of including the consumer voice in rapid research

Physical activity for early childhood education and care
Phoebe George, Telethon Kids Institute

Youth Think Tank: an innovative co-design approach to adolescent transition challenges
Lindsay Rowe

Perioperative Medicine
The team will present their current consumer engagement activities including the consumer reference panel and consumer focused research projects, and will discuss ways in which consumers can become more involved

Oral Abstracts

Thursday 5 November

Concurrent Oral Presentations Session 1

Multicentre Research Initiatives: Outcomes & Lessons Learnt PCH Auditorium, 1.00 – 2.30pm

Chair: Dr Simon Erickson, CAHS Neonatal Surgery

Validation of WINROP (online prediction model) to identify severe retinopathy of prematurity (ROP) in an Australian preterm population: a retrospective study

Desai S[1,2], Athikarisamy S[3,4,5], Lundgren P [6, 7], Simmer K [3, 4, 5], Lam G [8, 9]

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Australia, 4 Department of Neonatology, King Edward Memorial Hospital for Women, Perth, WA, Australia, 5 Department of Paediatrics, University of Western Australia, Crawley, WA, Australia, 6 Department of Clinical Neuroscience, Institute of Neuroscience and Physiology, Sahlgrenska Academy, University of Gothenburg, Gothenburg, Sweden, 7 School of Medical Sciences, Faculty of Medicine and Health, Örebro Univeristy, Örebro, Sweden, 8 Department of Ophthalmology, Perth Children's Hospital, Perth, WA, Australia, 9 Centre for Ophthalmology and Visual Science, University of Western Australia, Crawley, WA, Australia.

Background and aim: Retinopathy of prematurity (ROP) is the most common disease leading to blindness in extreme preterm infants. Current screening guidelines recommend frequent eye examinations. There is a dearth of trained ophthalmologists for these frequent screening procedures. The ANZNN neonatal network report (2013) found that only 6.4% of all screened infants had severe ROP and less than half received treatment. WINROP (online prediction model, Sweden) uses the postnatal weight gain (surrogate marker for low insulin- like growth factor IGF-1 and poor retinal vascular growth) to identify ROP requiring treatment and aims to reduce the number of examinations. Our aim was to validate the WINROP model in an Australian preterm cohort.

Method: Birth weight, gestational age and weekly weight measurements were retrieved retrospectively along with the final ROP outcomes and plotted on the online WINROP software.

Results: The sensitivity, specificity, positive predictive value, and negative predictive value of WINROP were 85.7%, 59.0%, 6.98%, and 99.1% respectively for a cohort of 221 preterm infants (Median birth weight, 1040 g; Gestational age, 27.9 weeks). WINROP alarm was

signalled in 42.6% of all infants. WINROP did not signal an alarm in one infant needing treatment. This infant had intra ventricular haemorrhage grade 3-4 and temporary ventricular dilatation.

Conclusions: This is the first Australian study validating WINROP model. Our findings suggest that it lacked sensitivity to be used alone. However, adjusting the algorithm for the Australian population may improve the efficacy and reduce the number of examinations when used along with the current screening guidelines.

Video laryngoscopy: standard versus non-standard blades within the Paediatric Difficult Intubation Registry

Robey E [1,2], von Ungern-Sterberg B [1, 2, 3], Peyton J [4, 5], Park R [4, 5], Kovatsis PG [4,5] et al and the PeDI Collaborative Investigators

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Background and aim: Videolaryngoscopes give a direct line of sight when intubating and improve tracheal intubation success rates in children with difficult intubations. This study classified videolaryngoscope blades into standard and non-standard shapes and compared their effectiveness performing tracheal intubation in children with difficult intubations.

Research method: Analysis was conducted on cases from the Paediatric Difficult Intubation Registry (March 2017 – January 2020) comparing success rates of initial and eventual tracheal intubation, complications, and technical difficulties between the two groups and by weight stratification.

Results: A total of 1313 children were analysed, with 529 categorised as intubated with a standard blade and 740 with a non-standard blade videolayrngoscope. Both blades were used for 44 patients. Standard blades had a significantly greater success than non-standard blades at initial (51% vs 26%, P=0.002) and eventual (81% vs 58%, P=0.002) attempts at tracheal intubation in children weighing <5kg. Multivariable logistic regression analysis showed, standard blades had three-times the odds of success at initial tracheal intubations (adjusted odds ratio 3.0, 95% CI: 1.32 – 6.25, P=0.0009). In children weighing <5kg the odds of success at eventual tracheal intubation were two and a half times greater with standard blades (adjusted odds ratio 2.6, 95% CI: 1.08 – 6.25, P=0.033). There were no significant differences in children weighing ≥5kg.

Conclusions: In infants <5 kg with difficult airways, videolaryngoscopy with a standard blade was associated with a higher success rate than with non-standard blades, making the standard blade a sensible choice for tracheal intubation in these high risk children.

Risk of Leukaemia in Children with Peripheral Facial Palsy

Borland ML[1,2,3], O'Brien S[1, 3]Babl FE [3,4,5,6], Kochar A [3,7], Osborn M[8] , West A [3,9,10], Williams A[3,4,5], Dalziel SR[3,11,12]

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Background and aim: Bell's palsy is characterized by sudden onset unilateral paralysis or weakness of the muscles of the face controlled by the facial nerve and is the most frequent cause of facial palsy in children. Differential diagnoses are broad and can include conditions such as leukaemia.

Research method: The Paediatric Research in Emergency Departments International Collaborative (PREDICT) emergency research network has just concluded a randomized, placebo-controlled trial of prednisolone for treatment of Bell's palsy in children at 11 emergency departments (EDs) in Australia and New Zealand. In the course of this study, we have identified 5 presentations of leukaemia associated with lower motor neuron facial palsy.

Results: During 4 years of recruitment, 153 patients with unilateral peripheral facial palsy were enrolled into the randomised placebo controlled study, with one case of leukaemia diagnosed (1/153, or 0.7%; 95% confidence interval 0.2% to 3.5%). Among 644 patients presenting with acute onset facial palsy who were screened for eligibility, 5 patients had leukaemia identified as the cause of the facial palsy, 4 without a history of leukaemia (4/644, or 0.6%; 95% confidence interval 0.2%to 1.6%).

Conclusions: Based on these cases, the Bells Palsy in Children Study protocol was changed to mandate the conduct of a complete blood count to reduce the risk of missing leukaemia in all children presenting with Bell's palsy prior to commencing corticosteroids. Clinicians who do not routinely include a complete blood count for children with new onset lower motor neuron facial palsy should consider changing their practice.

Metabolomics to predict asthma in preschool children

Schultz A[1,2], Hall G[1,3], Trengove R[4], Ang S[1], Lethbridge R[2], Laing I[1], Broadhurst D[5], Reinke S[5].

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Background: Differentiation of preschool wheeze into asthma and non-asthma would allow targeted treatment for those more likely to benefit.

We aimed to use metabolic biochemical profiling to discover novel urinary biomarkers of asthma in school-age children (6-10y) and investigate the potential to predict future development of asthma in preschool children (2-4y).

Research method: 211 children were recruited. Healthy preschool(n=25); preschool wheeze(n=87); school-aged healthy(n=43) and school-aged asthma(n=56). Urinary metabolic profiles at baseline and during exacerbations were characterised using liquid chromatography mass spectrometry.

The utility of each individual metabolite as a biomarker of asthma at school-age was tested using one-way ANOVA. Canonical Variate Analysis (CVA), followed by multivariate regression, was performed to identify a specific urinary profile for effectively discriminating school-age asthma from healthy controls. This model was then mapped to the urinary profiles of the preschool-wheeze children, collected under identical analytical and data processing protocols.

Results: 162 putatively identified metabolites were measured within approved levels of analytical repeatability. There was a significant ($p<0.05$) disease effect for 34 metabolites. CVA uncovered a strong exacerbation profile correlated to the preschool-wheeze exacerbation sample. Baseline and exacerbation regression models showed strong discrimination (AUROC=0.91&0.98 respectively). When preschool urinary profiles were projected through these models the proportion of preschool wheeze participants classified as “asthma”(~40%) was in-line with clinical expectations(~30%).

Conclusions: A putative multifactorial urinary biomarker of asthma has shown promise of predicting the onset of childhood asthma. Longitudinal follow-up is ongoing to determine predictive accuracy of the model. Targeted chemical assay development is underway.

FOT Equipment: From an Italian laboratory bench to paediatric theatres in W.A.

Nguyen J[1, 2], Vigevani S[1, 2, 3], Zannin E[3], Dellacà R[3], Sommerfield D[1, 2, 4], Sommerfield A[1, 2], von Ungern-Sternberg B[1, 2, 4]

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Background and aim: Forced oscillation technique (FOT) is a non-invasive method that aims to measure respiratory mechanics. Until now, a clinical method to continuously measure lung function during surgery without disconnecting the breathing circuit was unavailable. Engineers from Politecnico di Milan designed and constructed a novel continuous FOT system, which could be integrated into the anesthesia ventilator without interrupting ventilation, allowing for continuous monitoring throughout surgery. Here we describe the process of scaling up the equipment for real-life use and validating the equipment intraoperatively in accordance with existing FOT technical standards and clinical requirements at Perth Children’s Hospital.

Research method: Upon arrival in Perth, consumables were sourced and tested to optimize set-up. Electrical and safety testing was conducted before moving forward with *in vitro* theatre testing. Various endotracheal tubes and an artificial lung were used for *in vitro* testing in a series of experiments to optimize the set-up for use in a paediatric clinical setting.

Results: A functioning and safe FOT system was successfully optimized, one that can be integrated into the ventilator system, allowing for continuous monitoring intraoperatively. The developed system complied with all safety, electrical and infection control guidelines. It is now clinically used in two trials looking at respiratory mechanics and the effect of recruitment manoeuvres under general anaesthesia.

Conclusions: We demonstrated a successful introduction of this novel technology, a continuous FOT system, into clinical practice. The information it provides can guide clinicians towards a more patient-specific approach to intraoperative mechanical ventilation.

Keywords: Lung function, forced oscillation technique, equipment

The pipeline to validating a severity measure for the CDKL5 Deficiency Disorder

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1 Telethon Kids Institute, 2. Child and Adolescent Health Service, 2 Telethon Kids Institute, 3 Children's Hospital Colorado and University of Colorado School of Medicine

Background and aim: CDKL5 deficiency disorder (CDD) is a rare genetic disorder associated with early onset seizures, developmental delay, cortical visual impairment and other comorbidities. A CDD clinical severity assessment (CCSA) was previously developed with clinician and parent-report items to capture information on all domains. Consistent with FDA guidelines, content validation is the first step in evaluating the psychometric properties of an outcome measure. The aim of this study was to content validate the clinician-reported items in the CCSA in preparation for further validation.

Research method: Eight neurologists responsible for CDD Centre of Excellence clinics in the USA took part in individual cognitive interviews to critique the 26 clinician-reported items in terms of clarity, observability and feasibility. Common themes across interviews were aggregated and a literature search of related assessments was conducted to inform item modifications. The clinicians then took part in two consensus meetings to review themes and develop a consensus for the items and their structure.

Results: Following the cognitive interviewing and meetings, a consensus was achieved for the content of the CCSA. Nine of the original items were omitted, eleven items were added, and the remaining items were revised to ensure the clinician CCSA was fit for purpose. The processes resulted in 29 items classified into 3 domains of function, neuro impairments and behaviours.

Conclusions: This study enabled refinement of the CCSA and provided evidence for its content validity. This preliminary validation is essential before field testing and further validation, in order to advance the instrument towards clinical trial readiness.

Concurrent Oral Presentations Session 2

Innovation Culture – Driving Game Changing Shifts in Clinical Understanding & Care

Telethon Kids Seminar Room, 1.00 – 2.30pm

Chair: Assoc Prof Paul Watt (Telethon Kids Institute, Director Research Services and Innovation)

Remote After-Care Using Smartphones: Automated SMS to monitor children's pain at home

Thomas F E Drake-Brockman[1,2], Harry E Smallbone[1], David Sommerfield[1,2], Britta S von Ungern-Sternberg[1,2,3]

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Background and aim: Monitoring children's recovery postoperatively is important for routine care, research, and quality improvement. Although telephone follow-up is common, it is also time-consuming and intrusive for families. Using SMS messaging to communicate with families regarding children's recovery has the potential to address these concerns. Whilst a previous survey at our institution indicated that parents were willing to communicate with the hospital by SMS, data on response rates for SMS-based postoperative data collection is limited, particularly in paediatric populations.

Research method: We conducted a methodological pilot to examine response rates in practice, with planned recruitment of 100 patients across two hospitals, collecting and classifying daily average pain (0 to 10) each day after tonsillectomy until pain-free for two consecutive days.

Results: To date, 35 (78%) of 45 enrolled participants have recorded complete pain profiles, with 462 (98.3%) of 470 requests for a pain score receiving a response. Two families (4%) opted out of the trial, and eight (18%) were lost to follow-up. Responses received were classified automatically in 88% of cases, and no negative feedback was received, with a median (range) satisfaction score (1 = very unhappy to 5 = very happy) of 5 (3 – 5).

Conclusions: This methodology is likely to generalise well to other simple clinical questions and produce good response rates in further similar studies. We expect SMS messaging to permit expanded longitudinal data collection and broader investigation into patient recovery than previously possible using telephone follow-up at our institution.

A novel mHealth Application for young people with type1 diabetes to exercise safely

Shetty VB[1, 2, 3, 4], Soon WHK[4], Roby HC[4], Smith GJ[4], Fournier PA[3, 4], Paramalingam N[1, 4], Jones TW[1, 2, 4], Davis EA [1, 2, 4]

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Background and aim: We have co-designed a novel mHealth App named “acT1ve” which incorporates the latest exercise guidelines. Our aim was to pilot acT1ve in a free-living setting to assess its acceptability and functionality, and gather feedback to improve the user experience of the App before testing it in a larger clinical trial.

Research method: The study design used a mixed method approach. Ten subjects with T1D (mean ± SD age 17.7±4.2 y, HbA_{1c} 54±5.5 mmol/mol) were enrolled. Prior to installing acT1ve on their personal smartphone, each participant completed a semi-structured face to face interview about their current exercise management and expectations of acT1ve. Participants were then asked to use the App to guide their exercise management for 6 weeks. At the end of 6 weeks, participants completed a user Mobile Application Rating Scale (uMARS) and a second semi-structured interview. The uMARS data was assessed in its entirety and for each subscale (engagement, functionality, aesthetics, information, subjective quality and perceived impact), with scores presented as medians with interquartile ranges (IQRs). All semi-structured interviews were transcribed, and direct content analysis was used to summarise participant experiences.

Results: The major themes arising from the interview analysis were increased frequency and duration of exercise, decrease in fear of hypoglycaemia and high satisfaction with using acT1ve. This was reflected in the uMARS analysis where acT1ve was rated high for its overall quality 4.3(4.2,4.6) [out of 5], functionality 4.7(4.4,4.8), information 4.6(4.5,4.8) and aesthetics 4.6(4.5,4.8).

Conclusions: The acT1ve app is functional and acceptable with high user satisfaction.

NOSE - A pilot study to determine feasibility of newborn nasal sampling.

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Background and aim: A vulnerable epithelium and associated gene signature coexist in the upper and lower airways of children with asthma. What is still unknown is if this signature exists at birth, and can be associated with susceptibility to virus infections and development of wheeze, allergy and asthma?
The aims of this study were:
(1) To ascertain the level of participation, acceptability, and feasibility of nasal sampling in newborns.
(2) To assess the RNA quantity and quality for sequencing.

Research method: ORIGIN participants were introduced to the NOSE study at the 28- or 36-week ORIGINS visit. Newborns were consented at the ORIGIN birth visit (inclusion criteria baby born after 36 weeks gestation with no major health concerns) and nasal epithelial samples were collected using interdental brushes. RNA was isolated from these samples and assessed for quantity and quality for sequencing.

Results: 98% of ORIGINS families approached were interested in participating in the NOSE study and 71% of these families were consented at the ORIGINS birth visit and had no concerns for their newborn to have a nasal sample. Newborn response to nasal sampling was mild (sneezing or crying) with 70% of babies having no reaction. Although newborn nasal samples had low epithelial cells count and viability, RNA yield and integrity met sequencing requirements in 76% of samples. All RNA libraries sequenced passed QC.

Conclusions: Our study has demonstrated that newborn nasal sampling is safe, quick and acceptable; resulting in high quality RNA for transcriptomic analysis and sets the framework for the AERIAL (Airway Epithelium Respiratory Illness and Allergy) Study.

EHMT1 CRISPR modification in HEK293 cells recapitulates Kleefstra Syndrome disease phenotype.

Vanessa S Fear1 *, Catherine Forbes1, Denise Anderson1, Sebastian Rauschert1, Genevieve Syn1, Alexia Weeks1, Gareth Baynam2,3,4, and Timo Lassmann1.

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Background and Aim: There are an estimated >400 million people living with a rare disease globally, with genetic variants the cause of approximately 80% of cases. Next Generation Sequencing (NGS) allows high speed, affordable sequencing, however, disease diagnosis requires the genetic variant is validated functionally in a living cell. Laboratory functional validation creates a major bottleneck and patient often wait years if not decades for a diagnosis, with multiple clinical specialist visits.

Haploinsufficiency of the Euchromatin histone methyltransferase 1 (EHMT1) gene leads to Kleefstra Syndrome, a rare disease characterised by moderate to severe developmental delay/intellectual disability, childhood hypotonia and distinct facial features, comprising microcephaly.

This study aims to develop a new methodology pipeline to rapidly validate genetic variants, commencing with the EHMT1 (p.[Tyr1148=];[Tyr1148Leufs*9]) variant, herein referred to as EHMT1_Ter.

Research method: We introduced a genetic variant into the EHMT1_Ter in HEK293 cells with a pipeline of CRISPR editing, and amplicon sequencing for clonal selection. Subsequently EHMT1_WT and EHMT1_Ter HEK293 cells were analysed by RNAseq and CAGE. Differentially expressed (DE) genes were analysed with Enrichr, GSEA, and transcription factor motif examined with AME, MEM and DREME.

Results: We demonstrate recapitulation of Kleefstra Syndrome disease phenotype for the introduced genetic variant in EHMT1_Ter in HEK293 cells.

Conclusion: This juxtaposition of CRISPR genome editing with DNA and RNA sequencing and analytics provides a pipeline for rapid genetic variant validation to reduce the time to paediatric rare disease diagnosis.

Cardiac remodelling post mitral valve surgery in paediatric rheumatic heart disease.

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Background and aim: Rheumatic heart disease (RHD) causes substantial morbidity and mortality globally with Indigenous Australians aged 5-14 years amongst the worst affected. Optimal timing for and effect of mitral valve (MV) surgery on ventricular remodelling and function in paediatric patients is uncertain. We examined the impact of RHD MV intervention on cardiac remodelling and function and explored pre-operative indices which may predict outcome.

Research method: A retrospective analysis was completed of demographic, clinical and echocardiographic data of eighteen patients with RHD requiring MV repair/replacement over a 15 year period. Echocardiograms before and median 13.5 months following intervention were compared to healthy matched controls.

Results: Pre-operatively, patients had significantly larger left atria (LA) and ventricles (LV) than controls with no difference in function. Postoperatively, a significant reduction in LA and LV dimensions and mitral regurgitation (MR) were observed. Both LV ejection fraction (EF) (62.6 ± 6.1% vs 51.7±9.7%, p=0.002) and LV longitudinal strain (-24.3±4.1% vs -18.2±2.6%, p<0.001) fell post-operatively and were significantly lower than controls. LV end diastolic volume (EDV) ≥102ml/m2 was found to be predictive of post-operative dysfunction (EF <55%), with 70% sensitivity and 75% specificity.

Conclusions: This study describes the effects of MR, and its alleviation, on LV geometry and function in patients with RHD. Lower post-operative functional parameters may reflect adaptations to changing loading conditions or persisting post-surgical myocardial dysfunction. The significance of utilising EDV and myocardial strain to guide intervention timing, alleviating MR before significant LV dilatation occurs and preventing LV dysfunction in this cohort warrants further evaluation.

Arresting dental caries in refugee children: a conservative approach

Patel J[1,2,3], Cherian S[3,4], Turton B[5], Anthonappa R[1]

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Background and aim: Refugee children experience an alarmingly high prevalence of dental caries and face several barriers in accessing timely care often leading to emergency hospitalisation and the need for multiple dental extractions. Currently Sodium Fluoride varnish (NaF) is the best available topical fluoride agent to reduce the progression (arrest) of carious lesions. This Australian-first clinical trial investigated the efficacy of a novel Silver Diamine Fluoride (SDF) preparation in arresting dental caries among refugee children.

Research method: An assessor-blinded, two-arm randomised clinical trial was conducted within the Refugee Health Service with the primary outcome of interest being caries arrest. 38% SDF (Riva Star, SDI) or 5% NaF (Duraphat, Colgate) was applied biannually on carious lesions and outcomes evaluated using a clinical criteria. Caries arrest and lesion appearance were examined at approximately 12m using bivariate analysis and logistic regression modelling.

Results: Preliminary analysis included 920 lesions across 790 teeth and 100 children under the age of 12 years. A total of 67 children and 652 lesions were followed over an average time of 14.7m (SD 4.3m). SDF had a statistically lower proportion of active lesions compared with NaF (5.7% vs 20.2%, $p<0.001$ $\chi 2$). Multivariate modelling demonstrated that children in the SDF group had twice the odds of caries arrest after controlling for covariates (OR 2.17; CI 1.34, 3.53; p=0.002).

Conclusions: SDF was effective in achieving caries arrest when compared to NaF. As a non-invasive topical agent, SDF may potentially reduce the suffering caused by untreated dental caries for newly arriving refugee children.

Consumer & Community Involvement Showcase

The Manda, Telethon Kids Institute, 1.00 – 2.30pm

Join us for an overview of effective ways to involve and engage consumers and the community in research

Poster Abstracts

Wednesday, 4 November, 4:30pm – 6:30pm

PCH Collegiate Lounge, Level 5

1 Physical activity policy for early childhood education and care: results of a Delphi

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1 Telethon Kids Institute, 2 University of Western Australia, 3 University of Southern Denmark, 4 National Heart Foundation of Australia, 5 Queensland University of Technology

Background and aim: The aim was to develop a Physical Activity (PA) policy in consultation with early childhood education and care (ECEC) providers and stakeholders. The policy included ECEC specific PA recommendations clarifying the Australian National Quality Standards for ECEC.

Research method: A three round Delphi process was used to refine the content of the policy, and identify best-practice dissemination, implementation and evaluation strategies. During round one an international expert working group developed an evidence informed ECEC specific PA policy template. Rounds two (n=149 , response 61%) and three (n=89, response 35%) involved national online surveys to seek insight from a group of experts on the PA policy template.

Results: There was consensus on the key features that should constitute an ECEC PA policy. Key statements and recommendations for PA and sedentary time at ECEC were

reported as acceptable, as were implementation strategies targeting management/supervisors/educators, the physical environment and families. Nine strategies were identified as easy to implement and likely to have a strong level of influence. Key barriers and enablers to implementing strategies at the management/supervisor/educator, physical environment and family level were identified. Best practice policy dissemination and evaluation were confirmed.

Conclusions: The Delphi process enabled refinement of the content of this Australian ECEC-specific PA policy and provided expert advice of where best to target implementation strategies and how to overcome barriers. These findings will be used to support successful dissemination, implementation and evaluation of the PA policy in ECEC's across Australia.

2 **The Use of Botulinum Neurotoxin A (BoNT-A) for Paediatric Dystonia: The Lived Experience**

Gubbay A[1], Smith N[1], Gibson N[1,2]

1 Perth Children's Hospital 2. Curtin University

Background and aim: Dystonia in children causes significant pain and interference in function, care and comfort. We aimed to evaluate carer and/or child perceptive on the effectiveness of BoNT-A for children with dystonia as there is limited evidence for its use.

Research method: Prospective audit of all cases receiving BoNTA injections between 1/7/19 and 31/3/20. Children who received BoNT-A targeting dystonia were identified from the total cases in this period. Data was obtained from the Kids Rehab WA database and medical records.

Results: Two-hundred and ninety-one children received BoNT-A (422 injection series) with 32% having dystonia identified as the target. For the dystonia group, the majority children (93%) had cerebral palsy. Of the 135 injection series for dystonia, 90% had treatment goals documented prior to treatment. Goal categories were: Improvements in function (43%) (seating, standing, gait or activity participation); care and comfort (23%); pain (24%) and orthoses tolerance (10%). There was goal improvements in 75%, no goal improvement in 5% and no documented outcome in 20%. There was 1 adverse event related to procedural analgesia.

Conclusions: Goal directed BoNTA for dystonia is frequently effective. The importance of having a systematic approach towards identifying and documenting relevant patient goals, and recording outcomes was highlighted.

3 **Measuring the impact of a new model of care for newly diagnosed paediatric diabetes**

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Background and aim: The number of WA children diagnosed with diabetes annually has been rising over the last 20 years and ALOS at diagnosis has also been rising due to increasingly complex diabetes technology and declining staff ratios, creating an

unsustainable bed-day requirement. A 2012 RCT established that children could be safely discharged following a shorter inpatient stay with appropriate education and support. This project aimed to pilot a new model of care based on this evidence and to measure the impact on patient outcomes and costs.

Research method: The 6m pilot in 2019 followed extensive consultation across CAHS and incorporated a short inpatient stay for practical education, HiTH visits at home, 1:1 outpatient education sessions timed and paced to meet family needs and Community Health support. Inclusion criteria were >3y, English-speaking, HiTH eligibility and medical/psychosocial suitability. Controls were similar patients diagnosed in the 9m pre-pilot. The two groups were compared for clinical outcomes over 12m, patient satisfaction, family impact and diabetes knowledge at 3m and 6m, and ALOS at diagnosis.

Results: Pilot patients (N=38) had a lower ALOS than controls (N=107) (3.3±1.2d vs 6.1±1.8d,$p<0.01$). There were no differences in patient satisfaction or diabetes knowledge. Family impact was lower for pilot patients at 3m (32.5±15.9 vs 42.5±18.4,$p=0.04$) but not at 9m. To date there is no difference between the two groups in any clinical outcomes. Cost-benefit analysis will be completed by November.

Conclusions: Bed-day savings have been achieved without risk to patient safety by implementing evidence-based changes to the model of care for newly diagnosed paediatric diabetes.

4 The ORIGINS Project: Creating a platform to increase research capacity

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Background and aim: The dramatic rise in early onset non-communicable diseases (NCDs) (e.g., childhood obesity, the allergy epidemic and an increasing burden of neurodevelopmental disorders and mental ill health) reflect the profound early impact of modern environments on developing systems. The ORIGINS Project is a research platform enabling world class investigation of early antecedent pathways to NCDs and how to curtail these, through integrated study of the early environment, genetic predisposition, and the developing microbiome.

Research method: Funded for 10 years, we are recruiting 10,000 families birthing at Joondalup Health Campus over a 5-year period, following their progress over the first 5 years of life. We are developing an extensive databank and biobank in tandem with new technologies and multi-omics platforms. ORIGINS enable integration of sub-projects within the main observational cohort, including randomised controlled trials, interventions, mechanistic and observational studies and supports 'real-time' feedback for the cohort.

Results: Currently we have recruited over 4,000 families, collected over 5 million data points and over 150,000 aliquots of biological samples in our databank and biobank respectively. Over 2,800 babies have been born and over 800 have attended their one-year clinical assessment, with 22 nested sub-projects. An updated profile of the cohort will be presented including nested studies.

Conclusions: ORIGINS is a community intervention birth cohort invested in making positive change. It is our goal that ORIGINS will serve as an example of how a data platform can enable local and international research and provide pathways for prevention, early identification and treatment in developmentally vulnerable children.

6 Urine contamination rates in a Paediatric Tertiary Emergency Department – A quality improvement project

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Introduction: Paediatric infectious diseases. Collection of urine samples from young children with suspected urine infection is difficult and contamination leads to repeat investigation, delayed or misdiagnoses, and unnecessary treatments. We assessed contamination rates in a tertiary paediatric emergency department (ED) and aimed to identify modifiable factors for targeted intervention.

Methods: A prospective audit of urine collections performed in Perth Children's Hospital ED between May to December 2019. Urine was considered contaminated if there was mixed bacterial growth with low cell counts, high epithelial cell numbers, or both. Following analysis, remedial interventions/strategies were proposed using quality improvement methodology and implemented. Following intervention roll-out we repeated the audit.

Results: Pre-intervention, the urine contamination rate was 23/150 (15%) of samples sent to the laboratory and numerically highest in infants ≤6 weeks (8/20; 40%) and for in-out catheters among children ≤6 months when performed by doctors rather than nurses (3/7; 43% vs 2/21; 10%).

Interventions included male in-out catheter training for nursing staff and upskilling of junior medical staff, introduction of the 'Quick-Wee' method, and discouraging clean catch samples in infant's ≤6 weeks.

Post-intervention, the contamination rate was 17/150 (11%) samples. The rate in infant's ≤6 weeks was 1/26 (4%), and during in-out catheters by doctors was 3/15 (20%) in patients ≤6 months. Parent-collected 'clean-catch' specimens in children 6 months to 3 years had a contamination rate of 24% (5/21).

Conclusion: Urine contamination rates among very young infants and with in-out catherisation by doctors improved after our targeted interventions, but the decline was largely offset by frequent contamination of parent-collected specimens.

7 Parental sleep when the child is sick: A concept analysis.

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Background and aim: Poor sleep quality in parents with sick children can impact their health, well-being and caregiving responsibilities. A principle-based concept analysis clarified the conceptual basis of parental sleep when the child is sick. How the concept is described, used and measured in the current literature was explored.

Research method: CINAHL, Embase, MEDLINE, PsychARTICLES, PsychINFO, Pubmed, Scopus and Web of Science were systematically searched; 441 articles identified. Studies were included if they explored parental sleep, published in English and were peer reviewed. 62 articles were assessed using quality criteria for principle-based concept analysis to aid data extraction. NVivo was used to manage data and thematic analysis was undertaken.

Results: A precise definition is not present in the literature. Various tools have been used to measure parental sleep as well as exploration of parental sleep via sleep diaries and interviews. There is variability in the terminology used. Parental sleep when the child is sick is interrelated with other concepts (e.g. stress). A recommended definition is offered.

Conclusions: Having conceptual understanding aids to guide translational research and conduct studies important to clinical practice and research. Future research includes developing a measurement tool to be used in study design and future interventions.

Keywords: Parental sleep, sick child, concept analysis

8 Community Health Nurses recommendations on how to improve discharge communication

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Background: CAHS is working towards becoming one integrated service. A consistent theme identified by nursing staff during the integration process workshops held in 2019 was "Improve and increase communication, information and knowledge sharing across CAHS".

Aim: To explore community Health Nurses' recommendations to improve discharge communication from PCH to community health.

Research method: The Quality Improvement approach was used. Following a literature review and a review of the CAHS policy, seven online focus groups were held with Community Health Nurses to explore information required in a discharge summary, delivery method and resources. The focus groups were audio-recorded, transcribed verbatim and analysed with thematic analysis guided by Braun and Clarkes (2006) six steps.

Results: Seventy-four nurses participated. The range of experience was 1–38 years with a mean of 8.6 years. Three main thematic categories emerged; education, communication and risk identifiers. The recommendations from the Community Health Nurses were to educate CAHS staff, across all service providers on what community health can and cannot do; to improve communication using clear pathways and ease of access to information already available to referrers and; working in collaboration with PCH to identify and support families by identifying risk factors early and using current resources to scaffold the client journey.

Conclusions: Community Health Nurses identified solutions to how discharge communication from PCH to community health can be improved. By making changes to processes and structures already in place it may be achievable to create a seamless and equitable service for consumers within current resources.

9 Development of the International Child Research Checklist:Delphi Study(Stages 1-3)

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Background: When undertaking research with children, it is critical to follow an ethical approach. Currently, there is no collectively agreed upon international child (0-18yrs) health research checklist (CRC) available to guide researchers and enhance research activities undertaken with children.

Aim: To develop an internationally agreed upon reliable CRC.

Design: An online checklist development Delphi Study.

Methods: This study includes 4 sequential stages being 1. scoping review to generate initial items, 2. questionnaire development to explore research practices with internationally recognised child centred researchers (IRCCR) 3. analysis of IRCCR responses to generate the first CRC.

Analyses: Stages 1-3 included inductive thematic analyses where concepts on the phenomena of research undertaken with children were underlined, coded and grouped into smaller or larger categories and themes based on similarity of meaning to develop the IRCCR questionnaire and CRC. 4. The next step is a three-round Delphi study (importance, agreeance).

Results: The INCCR questionnaire included 36 open-ended questions over three themes (respect, beneficence, justice) and four age-brackets (0-1yrs, 2-4yrs, 5-10yrs and >11yrs). This was completed online by 14 of 32 invited IRCCR over 10 countries during June 2020. Overall, 1033 IRCCR responses generated 548 core statements that were synthesised into one syntheses (research activities undertaken with children); three themes (child-parent consent, assent, dissent (N=163); ethical conduct with children (N=236); child-friendly methodology (N=149)); 10 sub-themes, 34-categories and 99-statements.

Conclusion: The first 99-item CRC is complete to commence stage 4 where International Child and Family Centered Care experts will be invited to round-one of the Delphi-study.

Key words: Children, Research Ethics, Research Methods

11 Algorithms of Musculoskeletal Management: Children with Cerebral Palsy: A population based study.

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Background and aim: Western Australia has accurate population based data of musculoskeletal interventions provided to individuals with CP in the birth cohort (2000-9). The aim is the development of population based lower limb musculoskeletal management algorithms in children and adolescents with Cerebral Palsy (CP).

Research Method: Retrospective Cohort study **.**Data on age, type of intervention (BoNTA/ surgery), Gross Motor Functional Classification System level (GMFCS), ambulant status and motor topography at each intervention were extracted for this cohort and algorithms created using proportion of subjects in each age year that received BoNTA or surgery. Peak age and peak percentage of use of BoNTA and surgery by GMFCS, topography and ambulant status were calculated.

Results ; 769 subjects, mean age 12 years 11 months (SD 2 years 11 months. First recorded GMFCS level subject numbers were: 357 (46.4%) Level I, 172 (22.4%) Level II, 64 (8.3%) Level III, 78 (10.1%) Level IV, 94 (12.2%) Level V. 492 (64%) of the cohort received lower limb BoNTA; for these individuals the median (IQR) was 8 (4, 14) treatments and range 1-32. 237 (30.8%) received orthopaedic surgery, median number (IQR) of surgeries in those subjects was 2 (1, 2) range 1-8. Average peak age use for BoNTA by GMFCS Level and surgery has been determined Algorithms for management by GMFCS, ambulant status, and topography have been developed and will be presented as graphs.

Conclusion: This paper provides new important information for clinicians, funders and consumers to discuss treatment options for children in an Australian setting.

13 The Role of the Avatar for Trans and Gender Diverse Youth

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Background and aim: A significant proportion of trans and gender diverse (TGD) young people report membership of the gaming community and resultant benefits to wellbeing. To date their experiences and needs regarding a key feature of games, the avatar, are largely unexplored, despite increasing interest in the therapeutic role of avatars in the general population. The aim of this study was to better understand the role of the avatar in gaming, its impact on TGD young people's mental health, and their unique needs regarding avatar design.

Research method: N = 17 TGD young people aged 11-22 years (M = 16.3 years) participated in four focus groups. A general inductive approach was used to thematically analyze the transcribed data.

Results: TGD young people report therapeutic benefits of using avatars with positive mental health implications. Importantly, TGD young people use avatars to explore, develop and rehearse their experienced gender identities, often as a precursor to coming out in the offline world. They also report negative experiences of feeling excluded within mainstream gaming,

largely due to the constraints of conventional notions of gender that are widely reflected in game design.

Conclusions: TGD young people derive considerable therapeutic benefits from avatar use. Participants described simple game design features to better reflect gender diversity, such as increased customization and broader representation of gender expression in the avatar. Such changes would facilitate the positive gains reported by participants and better reflect the diversity of young people who use games. The findings have important implications for both recreational and serious or therapeutic game design.

14 Clinical experience with SUBA-Itraconazole at a tertiary paediatric hospital.

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Background and aim: Itraconazole remains a first-line antifungal agent for certain fungal infections in children including allergic bronchopulmonary aspergillosis (ABPA) and sporotrichosis, but poor attainment of therapeutic drug levels is frequently observed with available oral formulations. A SUper Bioavailability formulation of itraconazole (SUBA-itraconazole; Lozanoc®) has been developed, with adult studies demonstrating rapid and reliable attainment of therapeutic levels, yet paediatric data is lacking.

Objectives: To assess the safety, efficacy and attainment of therapeutic drug levels of the SUBA-itraconazole formulation in children.

Research method: A single-centre retrospective cohort study was conducted, including all patients prescribed SUBA-itraconazole from May 2018 to February 2020. Recommended initial treatment dose was 5mg/kg twice daily (to a maximum of 400mg/day) rounded to nearest capsule size and 2.5 mg/kg/day for prophylaxis.

Results: Nineteen patients received SUBA-itraconazole, median age was 12 years. Median dose was 8.5mg/kg/day and median duration 6 weeks. Indications included ABPA (16 patients), sporotrichosis, cutaneous fungal infection and prophylaxis. Of patients with serum levels measured almost 60% (10/17) achieved a therapeutic level, three with one dose adjustment and seven following initial dose. Adherence to dose adjustment recommendations amongst the 7 patients not achieving therapeutic levels was poor. Of patients with ABPA 13/16 (81%) demonstrated a therapeutic response in Immunoglobulin E (IgE) level. SUBA-itraconazole was well tolerated with no cessations related to adverse effects.

Conclusions: SUBA-itraconazole is well tolerated in children, with rapid attainment of therapeutic levels in the majority of patients and may represent a superior formulation for children in whom itraconazole is indicated for treatment or prevention of fungal infection.

15 Youth Think Tank: An innovative EMHS-CAHS co-design approach to transition challenges

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Background and aim: In August 2020, EMHS and CAHS collaboratively undertook a Youth Innovation Think Tank (YITT). This followed the development of the WA Youth Health Policy 2018-23, and recommendations from the WA Clinical Senate on the transition of adolescents from paediatric to adult health services.

The YITT sought to develop novel and contemporary solutions to challenges in adolescent transitions in collaboration with high school students (n=32) from across the metropolitan area; and prioritise innovation and co-design principles in the development and implementation processes.

Research Method: The YITT provided students and clinical mentors from EMHS and CAHS with training in Design Thinking, and the students with background information on the nature and scope of the challenge. A whole day event was hosted at Royal Perth Hospital (RPH). The students worked with their mentors to develop and pitch their solutions to executive judges.

Results: Several viable solutions were developed through the YITT and will be investigated for progression at EMHS and CAHS. The winning solution was developed by Methodist Ladies' College (MLC) and involved a digitally integrated 'information bridge', delivered through QR codes made available in common areas at PCH and RPH for transitional patients to provide links to age-appropriate information on hospital transitions. EMHS, CAHS and MLC are undertaking ongoing consultation to prototype the project.

Conclusions: The YITT highlighted the critical tenets of effective solution design through the eyes of an adolescent consumer. Themes that emerged included accounting for the emotional strain of transition, providing information at an appropriate health literacy level, and integration with digital tools.

16 Efficacy of parent information sessions for understanding children with ADHD

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Background: The Complex Attention and Hyperactivity Disorders Service (CAHDS) conduct parent information sessions across a number of different topics throughout each year. The aim of these workshops is to help participants better understand and relate to children with attention and co-morbid behavioural, developmental, social and learning difficulties. The four workshops cover different topics related to ADHD, and are facilitated by clinicians in related disciplines. The topics included; understanding your child's behaviour, family self-care and stress management, Social connectedness and communication, and sensory processing and ADHD.

Objective: To assess the efficacy of the parent information workshops on parental belief in their understanding, use of strategies, and resources, to help their child with attention and co-morbid difficulties.

Method: Parents who had attended CAHDS or whose children were engaged with Child Development Services, CAMHS, Schools and Private Paediatricians were invited to attend workshops held throughout the year. Parents completed a feedback survey before and after the session, and the results were compared.

Results: Parents and caregivers attended a total of 52 workshops over four years (2016 – 2019, N = 354). All workshop topics demonstrated a significant improvement in strategies for participants to help their child in the related topic. The majority of workshop topics demonstrated a weak to moderate improvement in parental resources and understanding. Statistical significance and sampling issues are discussed.

Conclusions: Information sessions for parents present as an efficacious treatment approach in the understanding and support of children with attention and co-morbid difficulties.

Key words: ADHD, Attention, Families, Education

17 Including the family in the recognition and response to paediatric clinical deterioration

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Background and aim: In Western Australia variations exist in the paediatric population, healthcare services and early warning systems (EWS) used. The ESCALATION project aimed to develop a uniform evidence-based paediatric EWS inclusive of family participation.

Research method: A prospective mixed methods implementation study was conducted. The central EWS component, the *Paediatric Acute Recognition and Response Observation Tool,* consisted of track and trigger age-specific charts using 10 weighted variables including family or clinician concern. The intention for the family concern variable was to indicate worsening in a child's condition from the family perspective. Posters and flyers were created with information for families to communicate their concern to staff. The system was trialled in six purposively selected metropolitan and country hospitals to evaluate feasibility and acceptability by chart utilisation audits, staff surveys/focus groups and interviews with parents whose children were inpatients.

Results: Clinician or family concern featured in 36/249 (14.5%) charts audited, with 93/186 (50%) staff surveyed agreeing that the family concern variable assisted in obtaining parents' views about a child's condition. Staff focus group participants were positive about the variable although Emergency Department staff reported they assumed family concern was always present. Thirteen parents were interviewed; all were positive about the inclusion of the family concern variable. Information displayed on posters supported parents to articulate concerns, although some held reservations about anticipated negative staff responses.

Conclusions: Incorporating family concern into the WA paediatric EWS is feasible and acceptable to users. Further work is required to support participation by families from diverse language and cultural backgrounds.

Keywords: early warning systems, paediatric, family involvement.

18 Development of an ESCALATION system for recognising and responding to paediatric clinical deterioration

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Background and aim: Failure to recognise and respond to patients' deteriorating health condition can have devastating consequences. In WA no standardised approach for recognising and responding to paediatric clinical deterioration had been adopted. This project aimed to develop an evidence-based state-wide paediatric early warning system.

Research method: ESCALATION was a prospective mixed methods implementation study underpinned by the UK's Medical Research Council's framework for process evaluation of complex interventions. The three step approach used was 1) evidence review and stakeholder consultation (consumers and health professionals) 2) planning and co-production and 3) prototyping. The resultant draft ESCALATION System was trialled for feasibility and acceptability in wards and Emergency Departments at six purposively selected metropolitan and country hospitals. Evaluation data collected were site characteristics, chart utilisation audits, escalation of care audits, staff surveys, staff focus groups and interviews with parents whose children had been inpatients.

Results: The ESCALATION System incorporated a track and trigger chart named *Paediatric Acute Recognition and Response Observation Tool* with ten weighted variables, a targeted communication model and escalation pathway. All hospitals completed the trial. Overall evaluation was positive, finding the system was appropriate for each setting. Required refinements included reformatting chart layout and removal of some redundant features.

Conclusions: ESCALATION is the first Australian paediatric early warning system to incorporate clinical assessment, clinician and family concern, an escalation pathway and a clinical communication model for timely action. The trial demonstrated that it is feasible to use and acceptable to all stakeholders. Next steps are state-wide implementation, evaluation and system performance assessment.

Key words: early warning systems, paediatric, development

20 The Risk-Stratified Use Of Vancomycin For Viridans Streptococci In Haemato-Oncology

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Background and aim: Viridans group streptococci (VGS) are an important cause of sepsis in paediatric haemato-oncology and transplant patients. VGS blood stream infection (VGS-BSI) can rapidly progress to shock and death with certain cohorts at greater risk. With increasing penicillin-resistance amongst VGS isolates, febrile neutropenia monotherapy with extended spectrum ß-lactam agents may be suboptimal. At our institution, the addition of empiric vancomycin is recommended in high-risk children with acute myeloid leukaemia (AML), post haematopoietic stem cell transplant (HSCT), and/or signs of with shock. We aimed to assess the safety and efficacy of this risk-stratified approach by examining VGS-BSI episodes.

Research method: From November 1 2016 to January 31 2020, VGS-BSI episodes in patients with acute leukaemia and those undergoing HSCT were prospectively reviewed. Clinical data and outcomes (presence of shock, death) were recorded. Antibiotic susceptibility, blood culture (BC) time-to-positivity (TTP), and initial empiric antibiotics were determined.

Results: Of the 19 VGS-BSI episodes, 58% (11/19) occurred in high-risk patients. Of the VGS isolates, 21% (4/19) were penicillin-resistant, 37% (7/19) had reduced penicillin susceptibility. Median TTP was 11.73 hours; 95% (18/19) of BC were positive within 15 hours, 100% within 17 hours. High-risk patients were more likely to have an isolate susceptible to recommended empiric antibiotics (OR 23.0; 95% CI 1.0-520.1; p=0.049). There were no infection-related deaths.

Conclusions: Our risk-stratified approach is safe and effective, leading to appropriate therapy in the majority of patients and good clinical outcomes. Based on TTP, empiric vancomycin can be safely discontinued in stable patients with no growth on BC at 24 hours.

21 Happy Hearts Program: Gross motor screening of post-surgical congenital heart disease infants.

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Background and aim: The Happy Hearts (HH) Program was established to identify infants at risk of gross motor (GM) delay following surgery for congenital heart disease (CHD). The aims were to establish a care pathway for identification/referral of eligible infants; assess feasibility of establishing HH program within existing workforce resources and identify the number of children with GM delay requiring ongoing intervention.

Research method: A collaborative triage, assessment and intervention pathway was designed and implemented for eligible children aged 0-2 years undergoing their first cardiac surgery between 1st January and 31st December 2019. Data was collected on cardiac procedure, assessment outcomes, interventions or referrals required and number of occasions of service at Perth Children's Hospital (PCH).

Results: One hundred eligible infants underwent surgery at PCH, with 90 referred to HH (mean Gestation Age= 37.4 weeks; SD=3.7). Seventy infants (77%) were assessed and triaged; 20 declined citing geographical locations or /involvement with other services; 6 were lost to follow-up and 1 deceased. Assessments occurred a mean =123 days post-surgery; SD=48. Most developmental screening utilised the Alberta Infant Motor Scale assessment

(72%), with the remainder receiving other appropriate assessments. Forty-two infants (60%) required more than one outpatient visit or community referral.

Conclusions: The HH care pathway and high attendance rate demonstrated the program was feasible within current resources. It was successful in identifying a high number of children at risk of GM delay who required on going intervention and who previously may have been missed without the HH Program pathway.

Keywords: Congenital heart disease, cardiac surgery, gross motor delay, physiotherapy, Happy Hearts Program, Alberta Infant Motor Scale.

22 Urinary tract infections in children: a causal narrative of infection and contamination

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Causal relationships are fundamentally rooted under all clinical practices but rarely explicitly recognised and described. This is especially the case for the assessment of urinary tract infections (UTIs) in paediatric emergency departments (ED), where clinicians are required to make timely decisions to ensure the best outcomes for their patients. Data from two observational studies assessing urine collection and UTI diagnoses in the Perth Children's Hospital ED found that 13% of urines had evidence of contamination; 76% of those collected in children <13-year occurred in children for whom there was low index of suspicion for UTI and for whom no empiric antibiotics were prescribed.

We worked with clinical experts 1-on-1 and via a facilitated workshop to elicit their understanding of the causal interactions between UTI pathophysiology, specimen contamination, and UTI management to identify where these causal pathways converge. These relationships were assessed through the lens of Bayesian Network modelling to produce a causal model, which we aim to parameterise to help predict the probability of true infection versus contamination, and to inform management decisions. Once validated, this could be applied to improve the management of UTIs in children and reduce inappropriate antibiotic use, by aiding diagnoses and the interpretation of culture results. To our knowledge this is the first causal model for paediatric UTI. We hope to provide an alternative perspective for clinicians when processing information concerning UTIs in children and create a basis for causal studies across the broad domain of infectious disease diagnosis.

23 Energy drinks: evidence of health risks behind the boost

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Background and aim: Energy drinks are highly caffeinated beverages which can contain high levels of sugar, sodium and herbal stimulants. They have catapulted in popularity among young Australians and represent the fastest growing segment of the beverage market. Despite the possible negative health outcomes and growing energy drinks industry, research into energy drink use and its associated health effects among young people is sparse. This study aimed to investigate the self-reported health effects associated with energy drink intake among WA adolescents aged 12-17 years.

Research method: In 2018, all grade 7-12 students attending 25 randomly selected WA secondary schools from low and high socio-economic areas were invited to complete an online survey. Participants reported if they had previously consumed energy drinks as well as adverse outcomes and whether medical attention was sought or considered.

Results: Of the 3688 participants, 51% reported having ever consumed an energy drink. Of the participants who had tried an energy drink, 55% reported they had experienced at least 1 adverse event, including talking faster than normal (26%), stomach upset (25%), heart palpitation (25%), difficulty sleeping/insomnia (24%), headache (24%) and agitation (23%); 53% experienced these adverse effects after consuming ≤1 250mL can and 9% had sought or considered seeking medical help.

Conclusions: Our study found over half of WA adolescents who had consumed energy drinks reported adverse outcomes, some serious enough to warrant seeking medical help. Public health authorities are justified in considering additional regulations on energy drinks, including minimum age restrictions and enhanced health warnings.

24 High intensity interval training in an aquatic environment is feasible in adolescents with cerebral palsy

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Aim: This pilot randomised controlled trial investigated the feasibility of aquatic high intensity interval training (HIIT) for adolescents with CP, who can ambulate independently but may choose a mobility aid in some circumstances.

Method: Twelve participants (age 14.8years ± 2.0; 5 males) were randomised to either an intervention group of ten weeks standardised, supervised aquatic HIIT exercise; or control group who received usual care. Each class comprised 10 one-minute exercise intervals. High intensity exercise was defined as the attainment of ≥ 80% of peak heart rate measured by telemetry. Primary outcomes related to the feasibility of the study protocol. Secondary outcomes, collected pre and post intervention, comprised peak rate of oxygen uptake, lean muscle mass, pain, and health-related quality of life.

Results: Of 119 potential participants, 46 appeared eligible and 17 consented, resulting in a recruitment fraction of 37% (95% CI 23 to 52). Twelve completed baseline assessments and were randomised (5 males; 14 years 7 months SD 2 years 0 months). In the intervention group, of 1190 exercise stations (across all participants and sessions), heart rate data were available for 1180 stations and high intensity exercise was achieved during 1111 stations (93%, 95% CI 92 to 95). All randomised participants completed the study and reported that the intervention was fun and provided friendship opportunities.

Conclusion: Aquatic high intensity interval training in ambulant adolescents with CP is feasible, while maintaining adherence and fidelity. Uncertainty remains on the efficacy of the intervention, highlighting the need for a large definitive trial.

25 Retrospective Study of Family Outcomes Following MST Therapeutic Intervention

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Background and aim: The CAMHS Multisystemic Therapy (MST) program is a structured therapeutic intervention for children (aged 12 to 16 years) presenting with severe behavioural difficulties.

The aims of this study were: 1) to observe the changes in child behaviours and parental factors at the post-treatment and at the 6 and 12 month follow up; 2) to test whether there is a correlation between parental factors and child behaviours.

Research method: This retrospective study extracted the data collected from 242 families engaged with the MST program during 2014-2019. The data were collected at different time points (pre-treatment, post-treatment, 6 and 12 months follow-up) which included demographic information, Child Behaviour Check List (CBCL), parental Depression, Anxiety and Stress Scale (DASS 21), parental style (PSDQ) and parental monitoring skill scores.

Results: More than 80% of children exhibited an improvement in CBCL scores following the MST intervention at all time points (post, 6 months & 12 months). Majority of caregivers reported a reduction in their stress level and some improvement in their monitoring skill and also parenting style. The changes in parental monitoring skills and parental mental well-being appear to showed correlation with improvements in child behaviour.

Conclusions: Most families were observed to achieve positive changes in their child's behaviour after the MST intervention and that maintained over the following 12month. These enduring changes appear to be concurrent with improved caregiver mental well-being, monitoring skill and parenting style. A further investigation on the correlation between parental factors and improved child behaviour is recommended

26 Early identification of communication impairment in cerebral palsy: Utilisation of the Knowledge-to-Action Framework

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Background and aim: The first year of life represents a critical window of heightened plasticity to language learning. Yet, the evidence-base informing identification of communication impairment associated with cerebral palsy (CP) is founded on data for children > 2 years of age. This represents a knowledge-practice gap and prevents access to interventions critical to minimising the consequences of communication impairment.

Project Aim: To identify early markers of communication impairment. These data will inform clinical practice change. Eighteen children with/at risk of CP and 18 typically developing (TD) children were followed at 3 monthly intervals from 6 months to 18 months of age (representing 4 time-points).

Research method: A longitudinal cross sectional study was conducted and framed within an Integrated Knowledge Translation (IKTA) framework.

Results: 1. Standardised testing at 6, 9 and 12 months showed a decline in early language ability of at-risk infants relative to TD peers (*p*s < .01). At-risk infants also lagged behind their TD peers in vocalisation and babbling development at 9 and 12 months (*p*s < .01), but not 6 months (*p*s > .10), suggesting associated speech motor impairment.

2. A significant decrease in assessment age reflected positive clinical practice change observed from study initiation to implementation (*p* < .01).

Conclusions: Data show identification of communication impairment < 2 years of age is possible and clinically feasible as evidenced by the changing clinical practice assessment behaviours. This study has also demonstrated the value of the IKTA framework to advance knowledge translation into health care systems.

27 Influenza hospitalisation and vaccination in Australian children: 2010-2019

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Background and aim: Children with comorbidities are at significantly greater risk of severe influenza outcomes compared to previously healthy children. However, influenza vaccine coverage remains inadequate in both children with and without comorbidities

Research method: Children <17 years old admitted with acute respiratory illness and tested for influenza at sentinel hospitals were prospectively enrolled in to the PAEDS-FluCAN surveillance network. Demographics, comorbidities, and diagnoses were evaluated with multivariable regression to identify predictors of severe outcomes including ICU admission, intubation, hospitalisation length, and mortality. Influenza vaccine effectiveness was estimated using a test-negative design and conditional logistic regression.

Results: Overall, 6057 influenza positive paediatric patients from 2010 to 2019 were enrolled in the PAEDS-FluCAN surveillance network. Influenza A was predominately identified in 69.3% of cases with the remaining being Influenza B. Comorbidities were present in 40.8% of cases, and increase patients' odds of ICU admission, antiviral treatment, respiratory support interventions, longer hospitalisations, and dying. Certain comorbidities including cardiac and neurological conditions increasingly predisposed children to more severe influenza outcomes, as did nosocomial influenza infections. Similar vaccination effectiveness was show in children with and without comorbidities. Vaccine coverage whilst overall suboptimal, was greater in children with comorbidities and increased over time.

Conclusions: Hospitalisation outcomes in influenza positive patients were significantly impacted by their age, comorbidities, and nosocomial influenza. Whilst significant vaccine effectiveness was demonstrated for all children, low coverage remains an issue despite national funding schemes. Increasing influenza vaccination in all children would reduce severe paediatric influenza outcomes

28 Use of criteria led discharge in acute asthma and bronchiolitis.

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Background and aim: Criteria led discharge (CLD) has been shown to improve patient flow in hospitals by facilitating efficient discharge and reducing length of stay without compromising patient safety. We aimed to investigate the use of CLD at PCH and identify adherence to the recommended clinical discharge criteria for asthma and bronchiolitis.

Research method: Retrospective audit using consecutive convenience sampling of general paediatric admissions for acute asthma and bronchiolitis between 1 Jan-31 December 2019. Demographic information, adherence to recommended clinical discharge criteria, use of CLD, length of admission and time of discharge were extracted from medical records.

Results: 50 cases were included. Length of admission was 29 ± 20 hours for asthma (n=25) and longer at 60 ± 57 hours for bronchiolitis (n=25). 72% of patients were discharged during

working hours (8am-5pm). In total, 60% of asthma patients and 64% of bronchiolitis patients met all criteria as per the CLD form upon discharge. However, CLD was only used for one asthma and one bronchiolitis case, representing 4% of all cases.

Conclusions: Despite majority of patients meeting the clinical discharge criteria on CLD forms for asthma and bronchiolitis, only a small minority were discharged using CLD. This audit identified a large group of patients in whom CLD would have been safe, appropriate and effective, yet was not used. Interventions and future re-audit are suggested to help improve use and awareness of CLD.

29 Development of a Basic Fracture Treatment - Quick Reference Poster

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Injuries are a common cause of presentation to the Perth Children's Hospital Emergency Department (ED). Bone plasticity and the presence of growth plates in children give rise to fracture patterns that are unique to the paediatric population. In order to support appropriate and timely management of fractures, staff in ED developed a Basic Fracture Treatment Quick Reference Poster. This poster summarises current ED guidelines and aims to provide ease of access to clinicians working in a busy department. Current information, including recent changes to guidelines, were summarised in poster form, with an emphasis on accessibility and clarity. Senior ED staff members, along with clinicians from the relevant surgical specialties, were consulted throughout the development of the poster, and all ED team members were educated in the use of the poster prior to its roll-out. Informal feedback from clinical staff has indicated that the poster is now one of the most frequently used resources in the department. Subsequent demand for the poster has led to its introduction in major Emergency Departments throughout Western Australia. Many country healthcare providers have also started using the poster. The reference poster has proven to be a valuable resource in guiding the management of paediatric fractures in an ED setting, both at Perth Children's Hospital and at peripheral healthcare facilities.

30 Changing of pancreatic function in Cystic fibrosis patients

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Background and aim: Pancreatic insufficiency (PI) is common in Cystic fibrosis (CF). Pancreatic function is assessed by measuring stool pancreatic elastase. Pancreatic enzyme replacement maybe started prior to results in patients failing to thrive (FTT). In addition, new CF modulators, such as Ivacaftor, can cause children to become pancreatic sufficient (PS) after years of PI.

Research method: Children who were seen in the CF clinic in 2019, were reviewed for the presence of pancreatic function testing at diagnosis. Repeat testing was reviewed for those on Ivacaftor, if initial results were borderline or were inconsistent with prescribing.

Results: Of the 205 children, 177 have had pancreatic function tested. Of these, 126 (71%) are PI. On closer review, three children with PI are not currently prescribed enzymes. They

are all growing well. Also, two children with PS were prescribed enzymes because of FTT. Their elastase was normal on repeat and they have since stopped enzymes.

One child had borderline results. Her elastase was repeated and she is now PS. Her enzymes were stopped.

Ten children are on Ivacaftor. All were offered repeat testing. Eight have completed, of which 2 children have become PS. One adolescent, as mentioned previously, is clinically PS.

One infant, developed oily stools at 6 months of age, and has become PI despite initially being sufficient.

Conclusions: Pancreatic sufficiency and the need for pancreatic enzyme replacement therapy can change during childhood in children with cystic fibrosis. New treatments, such as CF modulators, have the potential to improve pancreatic function.

31 Initial screen identifies upregulated circulating microRNAs in acute wheezing children.

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Background and aim: Children with an asthma exacerbation are a leading cause of hospital presentation in Australia. A subgroup of children has an increased risk of further exacerbation. MicroRNAs are a type of epigenetic mechanism regulating gene expression in response to environmental factors, without altering DNA. Studies show specific microRNAs are upregulated during tissue injury, thus may be early indicators of inflammation and potentially useful as predictive biomarkers. We aimed to identify candidate microRNAs that were significantly upregulated in acute wheezing children when compared to healthy controls.

Research method: Plasma collected from ten children recruited for the Mechanisms of Acute Viral Respiratory Infections in Children (MAVRIC) cohort were used to extract microRNA. Cases (n = 5) were children presenting to Princess Margaret Hospital with acute wheezing and controls (n = 5) were healthy children from the community. RNA was synthesised into cDNA and quantified using PCR micro-arrays testing for 84 microRNA species that activate and differentiate T and B cells. Fold expression was calculated using the $\Delta\Delta C_T$ method and exact Mann-Whitney test.

Results: Fourteen microRNAs were significantly upregulated ($P < 0.05$) in cases compared with controls. When comparing the median fold expression between cases and controls, cases had increased fold change from 3.2 to 22.5 for the 14 microRNAs. The top 14 microRNAs included several members from the let-7 and mir-23 families.

Conclusions: This preliminary screen showed specific microRNA species are upregulated in acute wheezing children. These microRNAs may present as potential biomarkers for children with recurrent wheeze and asthma.

Key words: acute asthma, biomarker, microRNA

32 Bone Health and Body Composition in children with Cystic Fibrosis.

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Background and aim: Bone density is adversely affected by Cystic fibrosis (CF). International guidelines recommend routine screening from eight years while Australian guidelines recommend screening during adolescence or those considered at risk. We aimed to determine the number of CF children scanned at PCH and their bone mineral density (BMD) and body composition.

Research method: A retrospective, cross-sectional, observational study of BMD using Dual Energy Absorptiometry (DXA) collected as part of routine care in children aged 8-18 years in 2020. Data included BMD z-scores at three bone sites; body composition; age at first scan and time to follow up scan/s.

Results: Fifty one of 128 children (40%) had a reportable DXA (mean age=12.15 years; SD= 2.80; mean body mass index (BMI) =18; SD=3.32; Z score -0.56). Twenty-two (43%) had normal BMD; 21 (41%) had a site at risk of low BMD (Z-score ≤-1.00 to -1.99) and eight (16%) had low BMD, (Z-score ≤ -2.00) including two children aged eight years. Fourteen children (30%) had more than one reported scan. Of children with normal BMI z-score and lean mass percentile, 53% and 56% respectively had a site 'at risk' or with low BMD.

Conclusions: There was a high prevalence of children with at risk or low BMD in the population screened, even in children with normal BMI and lean mass. Prevalence of low BMD in our cohort may be under reported. Routine scanning of all children from eight years may be beneficial to identify children with low BMD.

Key Words: Bone density, Cystic Fibrosis, Body composition

33 Investigating clinical trial endpoints in *USH2A*-retinopathy

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Background and aim: Usher syndrome is a genetic disease characterized by hearing and vision impairments. The symptoms usually onset by adolescence. Vision impairment is caused by degeneration of photoreceptors in the retina and typically results in progressive narrowing of the visual field and compromised night vision. Medical advances have introduced treatment strategies to this previously thought untreatable retinal degeneration. However, appropriate outcome measures must be presented prior to clinical trials to test the

efficacy of any treatment. Microperimetry is commonly utilized clinically to assess retinal function. We performed cross-sectional and longitudinal analysis on microperimetry parameters in *USH2A* (a genotype of Usher syndrome) patients and explore endpoints suitable for future clinical trials.

Research method: Microperimetry was performed using an 18° diameter grid. Four parameters (number of non-scotomatous loci, mean sensitivity [MS], responding point sensitivity [RPS], edge of scotoma sensitivity [ESS]) were analysed. Interocular symmetry was also examined. Longitudinal analysis was conducted in a subset of eyes.

Results: Microperimetry could be performed in 15/21 patients (average age 35.6 years), average number of non-scotomatous loci, MS, RPS and ESS were 46.6 loci, 10.0 dB, 14.7 and 9.6 dB, respectively. Interocular analysis revealed large 95% confidence intervals for all parameters. Longitudinally (N=12, average follow-up 2.6 years), ESS showed the fastest rate of decline (-1.84 dB/y) compared to MS (-0.34 dB/y) and RPS (-0.90 dB/y).

Conclusions: Our data suggest that ESS may be more useful than MS and RPS in test grids that cover a large extent of the macula. We caution the use of contralateral eye as an internal control.

34 Where are preschoolers active in childcare centres? A hot-spot analysis

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Background and aim: Physical activity has many health benefits for young children, however a large proportion of preschoolers are insufficiently physically active. Preschoolers spend a significant amount of their time in Early Childhood Education and Care (ECEC), therefore it is important to understand the influence of the ECEC environments on preschoolers' physical activity behaviour. Our study investigated preschoolers' physical activity 'hot-spots' and 'cold-spots' in ECEC outdoor play areas.

Research method: Participants included 399 preschoolers aged 2-5 years from 30 ECEC centres taking part in the Play Spaces & Environments for Children's Physical Activity (PLAYCE) Study in Perth, Western Australia. Children wore an accelerometer and a Global Positioning System (GPS) device for 7 days. Optimized hot-spot analysis (Getis-Ord Gi*) was performed using ArcGISpro to identify physical activity hot and cold spots in ECEC outdoor environments.

Results: Physical activity hot-spots were most frequently found in ECEC open areas and their adjacent outdoor play areas such as gathering areas. A total of 31 physical activity hot-spots and five cold spots were found in open areas. Having more free running space in nature play, sand play and dramatic play areas and their connection to open areas were also key physical activity hot-spots.

Conclusions:ECEC centres should balance the need for different types of play supported by various types of outdoor areas in order to best support physical activity levels and the health and development of preschoolers.

36 A system's approach to implementing effective student behaviour interventions in schools

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Background and aim: Whilst education policies recognise the need to support students with complex behaviour needs while also adopting a prevention approach for all students, there are many barriers to the high-quality implementation of effective interventions.

Research method: Drawing from empirical and practice-based evidence, this research aimed to: 1) Map the policy and practice context within New South Wales. 2) Identify opportunities to strengthen support to schools to address strengths-based (social skills) and risk-based behaviours (bullying). A review of international approaches and characteristics of effective interventions developed Principles of Good Practice. Policy makers and school staff were consulted to identify opportunities to strengthen support to schools.

Results: Findings support the need for whole-school prevention approaches that address the complexity of student wellbeing, behaviour and learning needs. Key are multi-component approaches that target the schools' social and physical environment and provide tiered support in developing the pro-social skills of all students and support for students 'at risk' and requiring individual intervention. Factors to support system-level implementation included strengthening data, leadership, competency, partnerships and resourcing.

Conclusions: These findings informed the development of a Student Behaviour Strategy that aims to support schools to assess their community needs, implement evidence-based practices and monitor their impact on student behaviour and wellbeing outcomes.

Key words: Behaviour, schools, implementation

37 Outbreak of anorexia nervosa admissions during the COVID-19 pandemic

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Background and aim: The COVID-19 pandemic has had broad social implications for children around the world. PCH is the sole tertiary paediatric hospital within Western Australia and admits all children aged less than 16 years with anorexia nervosa requiring medical stabilisation. Children are admitted for medical stabilisation based on criteria including severe malnourishment and/or evidence of significant cardiovascular compromise.

We aimed to determine any significant change in Western Australian AN admissions during COVID-19.

Research method: Poisson linear regression analysis of the association between year and count of admissions after adjusting for month was performed for January to July, 2017-2020.

Results: Since the commencement of the COVID-19 pandemic we have observed a 127% increase ($p<0.001$, 95% CI +83% to +182%) in children with anorexia nervosa requiring admission to hospital for nutritional rehabilitation compared to the three previous years.

Conclusions: Several factors may have contributed to the increase in children with AN requiring hospitalisation. We hypothesise that a combination of social isolation and disruption of routine has disconnected patients from protective factors. COVID-19 associated anxiety, food security and financial stress may be especially intensely experienced in those with AN. Clinical outpatient service delivery during COVID-19 has also changed.

We urgently need to understand the key factors driving the increase in admissions so we can implement strategies to better support young people with AN as we transition to our 'new normal'.

39 Resilience Strategies for Clinicians to Reduce the Psychological Impact of COVID-19

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Background and aim: The COVID-19 pandemic marks an extraordinary global crisis. Clinicians will endure disruption to normality and maintain a state of high alert for an extended period. Support received before and during a crisis influences whether clinicians experience psychological growth or injury. Abundant information is emerging including disease epidemiology and pathogenesis while literature on interventions to support healthcare workers' psychological well-being is less available. This review identified management strategies to increase healthcare worker resilience and minimise psychological injury. Healthcare institutions must improve and preserve workforce well-being now and going forward.

Research method: A narrative review was conducted. A search of the Pubmed database was performed using the terms: resilience, moral injury and burnout with various combinations of the keywords: health worker, doctor, strategies, covid, pandemic, ebola and SARS.

Results: Historical data shows healthcare workers exposed to health crises are more likely to experience higher levels of burnout and psychological distress. Long-term consequences include predisposition to depression, substance abuse and increased risk of medical errors. Resilience may be an important factor in the difference between clinicians who suffer burnout compared with those that do not. Resilience strategies at both the individual and organisational level were identified.

Conclusions: It is essential that strategies to promote clinician resilience are developed and implemented to counter psychological distress in health workers. Findings are of value to

stakeholders in healthcare and are expected to inform strategies to optimise the capacity of the health workforce both for the current crisis and into the future.

40 COVID-19 and paediatric health services: A survey of paediatric physicians in Australia and New Zealand

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Background and aim: COVID-19 is a global pandemic that has been recognised to cause significant disruption to health care organisations. This study assessed attitudes, readiness and confidence of paediatric physicians and sub-specialists in the early stages of the COVID-19 pandemic and elucidated factors that influenced attitudes.

Methods: Multiple email list group were used to contact paediatric physicians to undertake a Likert Scale survey between 17 and 24 March. Respondents' speciality, experience and work setting were recorded. Ordinal logistical regression was used to determine respondent factors.

Results: There were 542 respondents from across Australia and New Zealand: an estimated 11% of the paediatric physician workforce. A minority (36.6%) agreed that their national response had been well coordinated; the majority (92.7%) agreed that senior-level hospital administrators were taking the situation seriously. Most reported a good understanding of the natural history of COVID-19 in children, and knowledge of where to find local information. A large proportion of physicians (86.1%) were worried about becoming infected through their work; few (5.8%) reported that they would not come to work to avoid infection. Closure of school and childcares would reduce the ability to continue work at current capacity for 23.6% of respondents.

Conclusion: Despite limited experience in pandemics, most paediatric physicians felt informed. Concern about exposure at work is common; most were willing to work regardless. The closure of schools and daycares may have an impact on staffing. Coordination and leadership will be critical.

41 Evaluating the ARF diagnosis calculator

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Background: Recurrent episodes of Acute Rheumatic Fever (ARF) is the primary risk factor for Rheumatic Heart Disease (RHD) development and is dependent upon early diagnosis and institution of secondary prophylaxis. The ARF Diagnosis Calculator, embedded within the RHDApp, was developed to provide an easy to use algorithm to assist clinicians in diagnosing ARF.

Aim: To evaluate the ARF Diagnosis Calculator amongst clinicians in the Northern Territory.

Research method: This evaluation was completed in three cohorts. The first a survey of clinicians working at the Top End Health Service in the Northern Territory to identify usability, accessibility and written feedback. The second, in-depth semi-structured interviews of specialist clinicians, analysed through content analysis. The last cohort involved the comparison of ARF diagnoses made by a clinical team of experts against that of the calculator.

Results: The ARF Diagnosis Calculator was highly recommended (n 23, Mean 5.57, SD 0.59) and easy to use (n 23, Mean 5, SD 1.13) using a 6-point Likert scale. Semi-structured interviews identified five themes from the analysis. The calculator was considered easy to use and educational however concerns were made regarding the oversensitivity of criteria and the importance of clinical experience in a challenging and heterogenous disease. There was good replication of results between expert panel and calculator, with four cases differing.

Conclusions: The ARF Diagnosis Calculator is an easy to use and accessible tool to assist clinicians with ARF Diagnosis. The ARF Diagnosis Calculator does not replace clinical experience and evaluation.

42 Audit of the outcomes of patients with developmental disability presenting to ED with acute behavioural disturbance.

Dr Rachel Dwyer

An increasing number of children with autism and neurodevelopmental disability are presenting to ED at PCH with acute behavioural disturbance. The hospital stay is often unsatisfactory for patients, parents and caregivers as hospital is not the best place for these children to be managed.

The purpose of this audit is to determine if the admission guidelines is being followed, including-

1) The investigations performed when the patient is admitted.
2) The number admitted to the ward versus the number discharged directly from ED.
3) The number of code blacks and hours of 1:1 special nursing or xmen security guards the patients require during their admission.
4) The number of readmissions and or representations the patient has during the audit period.
5) Determine the cost of each admission.
6) Describe the residential location of the patient using the Rural, Remote and Metropolitan Areas classification (RRMA) .
7) How many patients are known to Child Protection Family Services or child protection unit and family services prior to their presentation to ED.

It is hoped that the outcome of this audit will help PCH provide timely and appropriate care for the young person that is sensitive to their needs.

Key words- Behavioural disturbance, autism, admission pathway

43 The support needs of parents in paediatric palliative care: A pilot study comparing cancer and non-cancer groups

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Background and aim: Parents of children with life-limiting illnesses experience considerable burden and distress, yet few interventions have targeted their well-being. The research aim was to evaluate the use and feasibility of the Paediatric Carer Support Needs Assessment Tool (pCSNAT) in assessing and addressing parents' needs for cancer and non-cancer conditions.

Research method: A non-randomised prospective intervention pilot study. Twenty-eight parents (out of 42 approached) and five health professionals working in paediatric palliative care services in Western Australia (2018–2019) completed the pilot study. The pCSNAT and parent carer outcome measurement tools were completed at initial encounter and for a second time within 2-8 weeks.

Results: Two-thirds of eligible parents completed the study. The highest support needs included the following: having time for yourself; practical help in the home; knowing what to expect in the future; financial, legal or work issues; and knowing who to contact if you are concerned. Almost all needs were considerably more pronounced for the non-cancer group. The pCSNAT seemed feasible to use and parent carer outcomes demonstrated a tendency to improve over the two time periods.

Conclusions: Using the pCSNAT provided a concise and comprehensive 'one stop shop' for health professionals to evaluate difficulties encountered by parents and address support needs. The disadvantages reported by the non-cancer group warrant increased attention. Paediatric palliative care should adopt a systematic, evidence based routine assessment of parents' support needs to anticipate early and tailored supports including partnerships with the community.

Key words: cancer, children, health professionals, life-limiting illness, non-cancer, paediatric palliative care, parents, support needs

44 Development and Validation of a Measure of Sleep for Children with ADHD

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Background and Aim: Attention Deficit Hyperactivity Disorder (ADHD) is the most common childhood neurodevelopmental disorder. ADHD symptoms can lead to impairments in other areas of functioning – approximately 75% of children with ADHD also experience difficulties with sleep. Similarly, Childhood sleep difficulties intensify ADHD symptom severity and cause additional impairments. There is growing support for routine assessment of sleep as part of standard ADHD management. However, assessment of sleep difficulties remains poorly addressed as they fail to account for the unique expression of sleep difficulties present in children with ADHD. Our recently submitted systematic review identified the lack of appropriate tools to screen children with ADHD for sleep difficulties.

Research Method: This multi-phase research will address this gap in current knowledge by undertaking a comprehensive project that will develop, trial, and evaluate a fit-for-purpose screening assessment of sleep difficulties in children with ADHD. This project will: (i) *develop* a purpose-built screening instrument with the aid of consumer and clinician engagement, (ii) *validate* this this new measure for the assessment of sleep in children with ADHD, and (iii) *evaluate* an information intervention of sleep problems for children with ADHD with the new measure.

Anticipated Results: A screening instrument will be developed through collaboration with sleep experts and parents of children with ADHD which will then be piloted and validated using best practice methods.

Implications: It is anticipated that this research will help to provide clinicians with greater accuracy in identifying sleep difficulties in children with ADHD and therefore enabling opportunities for early intervention and improved treatment outcomes.

45 Intensive, sub-acute physiotherapy improves children's function following orthopaedic surgery in Cerebral Palsy

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Objective: Multi-level orthopaedic surgery in children with Cerebral Palsy (CP) requires significant physiotherapy to regain function. The efficacy of a sub-acute, intensive, family centred, goal-directed program is not understood. We aim to describe outcomes of our program with a focus on return to pre-operative function.

Design: Audit of children with CP attending intensive rehabilitation following multi-level orthopaedic surgery between July 2015 to July 2019.

Method: Forty children (mean 10.15 years, SD 3.27 years) with CP were included. Intervention was offered three days a week for six weeks. Canadian Occupational Performance Measure (COPM) scores, Functional Independence Measure (WeeFIM), Functional Mobility Scale (FMS) and achievement of goals on the Goal Attainment Scale (GAS) were collected. SPSS non-parametric tests analysed data between pre- and post-rehabilitation.

Results: The program was well attended (mean attendance 91%; SD 11.6%). Post-program COPM scores significantly improved (z score -5.449, $p<0.01$ and z score -5.436, $p<0.01$ respectively). WeeFIM scores significantly improved post program (z score -4.54, $p<0.01$). 85% of GAS goals were achieved. FMS (5m) improved significantly post program (from median of 1 to 3; z score -4.594 $p<0.01$) but did not return to pre-operative mobility scores (median= 5). FMS (50m) improved from median of 1 at post-operative, to 2 (z score -3.915, $p<0.01$) which was equal to pre-operative mobility (median= 2).

Conclusion: Intensive, sub-acute physiotherapy improves functional mobility. High attendance rates, goal achievements and COPM scores reflects the efficacy of an intensive program. Children make significant mobility gains post rehabilitation, increasing independent indoor mobility thereby reducing carer burden.

Key Words: Cerebral Palsy, Physiotherapy, Rehabilitation

46 The evaluation of a medical training course on child abuse and neglect

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Background and aim: Child abuse and neglect is major public health issue with an annual incidence of 8.5 per 1000 children in Australia. It is essential that all doctors working with children and young people are trained in this area. Child protection training is a mandatory requirement for RACP advanced trainees completing General Paediatric and Community Child Health training. Attending an accredited course fulfils part of this requirement.

Research method: In response to this requirement, the CPU at PMH/PCH developed a four-day child protection course, accredited by the RACP. Attendees are asked to complete daily course evaluations, providing a rating of 1-5 (very poor to excellent) for each presentation, as well as written comments

Results: The course has been held annually from 2013 to 2019 (no course 2016) with between 20 to 26 paediatric trainees and consultants, from WA and interstate, attending each year. The course has received excellent feedback with 93% (in 2014) to 96% (in 2019) of presentations receiving a rating score of 4 or 5 on evaluation.

Conclusions: CPU has successfully designed and held a child protection course to fulfil training needs and provide important up-to-date education in child abuse and neglect. Feedback has been positive and utilised to further improve the course.

Key words: child abuse, training, evaluation.

47 Reproductive Health Counselling and Fertility Preservation Among Adolescent Oncology Patients.

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Purpose; More than 80% of children diagnosed with cancer become long term survivors following treatment. Outcomes are marred by numerous serious and permanent long-term sequelae including impaired fertility. Ideally, patients facing cancer treatment should receive reproductive health counselling (RHC) prior to commencing therapy. The aim of this study was to assess the documented discussion of infertility risk and evaluate the utilisation of fertility perseveration methods among newly diagnosed adolescent oncology patients.

Methods; All adolescent patients with a new diagnosis of malignancy from 2017 to 2020 were included. A retrospective chart review was conducted to collect data on RHC and use of fertility preservation methods. Risk factors for future subfertility were identified including cyclophosphamide equivalent dose (CED) and radiation treatment.

Results; A total of 38 patients were identified; 23 male and 15 female. 15 patients (39.5%) had documented evidence of RHC prior to commencing therapy. Overall, eight (21%) undertook fertility preservation measures; five (22%) male patients participated in sperm banking, and three (20%) female patients had a gonadotrophin releasing hormone agonist (GnRHa) implant inserted. Planned treatment included radiation in 18% and CED ≥5g/m^2 in 42%; of these high-risk groups 55.5% received RHC and 38.8% took fertility preservation measures. Those with evidence of a pre-treatment RHC were 4.5 times more likely to participate in fertility preservation measures; 40% in comparison to 8.7%.

Conclusions; Despite being an at-risk group for future fertility issues the majority of adolescent patients did not receive RHC nor utilise fertility preservation methods prior to commencing therapy. Our data reveal that appropriate pre-treatment RHC could increase fertility preservation utilisation in this population.

Key Words: Fertility, Oncology, Adolescent**.**

48 The Australian Hospital Patient Experience Question Set for Parents (AHPEQS-Parent)

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Background and aim: The Australian Hospital Patient Experience Question Set (AHPEQS) was developed by the Australian Commission on Safety and Quality in Health Care (the Commission) to ask adult patients about their experience of inpatient care; domains measure respectful care and information. Supported by the Commission, this mixed-

methods study aimed to adapt and validate the AHPEQS for parents of children who have received inpatient care. We assumed that parent experience would differ to child experience.

Research method: Parents (*n*=14) of children who had been admitted to hospital for care were interviewed to identify their experience that their own needs, and their child's needs, were met. Content analysis was used to identify experience specific to parents and children, the question set amended, and content validity assessed. In continuing research, factor analysis (*n*=1500) will be used to identify construct validity.

Results: At interview, all parents spoke of their role in the care of their unwell child, with associated stress, fear, or emotional distress. Many asked for: emotional support; to be respected for their knowledge of their child; and for clear communication. The original 12-item question set was amended to reflect parent reported outcomes, and 4-items specific to parent experience added. The revised question set will be presented.

Conclusions: Parents of inpatient children experience unique needs and emotions. The AHPEQS-Parent aligns with the original question set to reflect this while facilitating consistent reporting of inpatient health care experience for children by parents; including respectful care, effective communication, and emotional support.

49 Does the label 'below the national minimum standards' improve student's NAPLAN performance?

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Background and aim: Literacy and numeracy are fundamental human rights and tools for life. One of the purposes of Australia's National Assessment Program Literacy and Numeracy (NAPLAN) is to identify students who are not on-track for their year level and galvanise actions to improve learning outcomes in subsequent years through targeted interventions. This study investigated the question of whether students who were identified as performing below the National Minimum Standards for reading and numeracy in a given school year showed improved performance in subsequent school years.

Research method: This study used 2017 NAPLAN data from the Australian Curriculum, Assessment and Reporting Authority. Regression discontinuity models were estimated to compare achievement trajectories for students scoring just below and just above the minimum standard cut-points for reading and numeracy.

Results: On average, all students' scores increased across Years 5, 7 and 9, and yet, performance gaps between students below the National Minimum Standards and students at or above the National Minimum Standards persisted. Furthermore, labelling students as performing below the minimum standards had no significant effects on reading or numeracy achievement in Year 5, 7 or 9.

Conclusions: The results highlight the need for early identification and interventions for children who do not meet age/school year expectations for literacy and numeracy.

50 Introducing the PCH EXPAAND Project – A prospective study to comprehensively assess risk factors in children and adolescents who present with deliberate-self-harm and evaluate the efficacy of a brief nested intervention at the time of an acute mental health crisis.

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Rates of deliberate self-harm (DSH) in children and adolescents (C&A) have increased in prevalence, severity and chronicity, and this problem is now considered a major public health issue that is associated with high personal and societal costs, as well as high service burden. While DSH has been increasingly studied across lifespan, particularly high rates of DSH in C&A remain poorly understood. These knowledge gaps represent an opportunity to gain better understanding of the psychopathology responsible for vicious cycle of DSH, and to develop better and more efficacious evidence based treatments.

This project will explore specific aspects of emotional functioning and attention spectrum disorders, each of which has been identified as elevating the risk of DSH. More specifically, Dissociative Disorder (DD), Alexithymia, Substance Use Disorder (SUD), Attentional Deficit /Hyperactivity Disorder (ADHD), Sluggish Cognitive Tempo (SCT), are all identifiable and treatable conditions, and can elevate the risk of DSH by different causal pathways.

This will be done in three parts. In the first part, rates of these psychiatric and attention conditions and syndromes will be assessed in C&A at Perth Children's Hospital Emergency Department across a 12-month period. Secondly we will explore the relationship between these identified conditions and DSH behaviour. The final part of the project will evaluate the effectiveness of a brief nested randomised control trial intervention on clinical presentation, service utilization and engagement in treatment.

51 Touchstone Research Register: A Databank for Adolescents with Borderline Personality Disorder and Deliberate Self-Harm Behaviours

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Background and aim: Touchstone CAMHS is an intensive day therapy service for adolescents with Borderline Personality Disorder and deliberate self-harm behaviours, established in 2015. Touchstone utilises Mentalization Based Therapy (MBT) over a six month intensive day therapy program, where clients participate in a wide variety of therapeutic intervention, including the collection of a number of research measures that inform clinical practice and track progress of a client's journey. The Touchstone Research Registry aims to collate this information and to provide a databank that can support a diverse range of research intended to find the best evidence about self-harm and related problems to more effectively prevent, identify and treat them.

Research method: Data collected as part of the Touchstone quality improvement include self-report questionnaires; parent-report questionnaires; clinician ratings; and audio and video of therapeutic sessions. Client data collected includes, but is not limited to, The Moods

and Feelings Questionnaire, The Brief Borderline Personality Features Scale for Children, The Connor-Davidson Resilience Scale (CDRS), and Inventory of Statements about Self-Injury. Parent data includes The Parent Reflective Functioning Questionnaire, The Borderline Personality Disorder Features Scale, The Stress Index for Parents of Adolescents and The Family Assessment Device General Functioning.

Results: Records consisting of over 20 measures, scales and assessments collected over the course of a 6 month client journey through Touchstone at Pre Assessment, Midway and Discharge are available through the register. This is expected to increase by an average of 20 data sets per year.

Conclusions: Future research priorities for the Touchstone Research Registry include the development of a wider assessment process for determining dimensions of personality, as well as establishing industry connections to promote collaborative research partnerships.

52 Are epithelial cell cytokines associated with atopic dermatitis during infancy?

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Background and aim: Early onset of atopic dermatitis (AD) in infancy typically precedes the development of other atopic diseases. Epithelial cell (EC) cytokine expression patterns may be a potential biomarker in early life to target allergy prevention strategies towards 'at-risk' infants.

This investigation aimed to examine associations between circulating levels of EC cytokines (thymic stromal lymphopoietin (TSLP), interleukin (IL)-33, and IL-25) and infant AD.

Research method: We collected cord blood (n=31) from atopic mothers and followed up their infants at 4-6 and 12 months of age for collection of blood samples and diagnosis of AD. We also measured EC cytokines in blood samples collected at 4-6 months of age in an additional 60 infants with and without early onset AD. TSLP concentration was measured by enzyme-linked immunosorbent assay (ELISA) after acetone precipitation of the samples. IL-33 and IL-25 were measured by Luminex.

Results: Early onset of AD was associated with higher levels of EC cytokines at 4-6 months of age. From the longitudinal investigation of 31 mother-infant pairs, we found infants who developed AD had lower levels of IL-33 and IL-25 at birth compared to infants who did not develop AD during infancy (first 12 month-of-life).

Conclusions: This study found that higher levels of EC cytokines at 4-6 months of age are associated with early onset AD. However, we also discovered that lower cord blood levels of IL-33 and IL-25 were associated with AD during infancy. Hence the timing of measurement of EC cytokines may be critical in targeting these cytokine pathways for the prevention of AD.

53 Can we improve aerosol delivery to children computationally?

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Background and aim: In order to potentially improve aerosol delivery emitted by pressurised metered dose inhaler to paediatric patients using tracheostomy tubes, an *in silico* solid particle computational fluid-particle dynamic model was validated.

Research method: A geometry, designed to mimic a 5 mm paediatric tracheostomy tube was created using Python software and imported into computational fluid-dynamic software, OpenFOAM. Computationally, a single dose of aerosol was injected into the tube at the devices reported speed, superimposed on a paediatric patient inhalation. *In silico*, particles were deemed to deposit in the tube when within a radius width of the tube lumen. The software solved for conservation of momentum, and mass (Navier-Stokes equations), coupled with discrete particle tracking. The Pawsey Supercomputing Centre was used to process the simulation. For validation, deposition in tube was also determined *in vitro*, by measuring solid (drug) aerosol particles with high performance liquid chromatography.

Results: Computational simulation showed 90% of the aerosol will deposit in the tube, and this is dependent on particle-size and flow rate. The simulated result was successfully validated by the laboratory result by matching the mass exiting and within tube within 10%.

Conclusions: Aerosol drug delivery via tracheostomy tube is less than 10% of the intended dose when delivered via pressurised metered dose inhaler alone and can be optimised by methods developed here.

54 The role of the clinician for Children in State Care

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Over the last 2 years I have been investigating the medical pathways in Western Australia pertaining to children in state care. I have met with the major stakeholders, specialist medical practitioners, general practitioners, dental practitioners, foster parents and the Department of Communities who are the legal guardians of these children. I have identified both strengths and weaknesses in the current process. I have looked in detail at the initial medical assessment when a child goes into care. Based on the Adverse Childhood Experience Studies (ACE) of Felitti in the mid 1990's I have formulated a tool that would allow a practitioner to better assess these children and there-by assist their ability to access the necessary services they need.

Key Words: Children in Care, Initial Medical Assessment

55 Community Wellbeing during the COVID-19 Pandemic: The ORIGINS Cohort

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Background and aim: The impact of the COVID-19 pandemic on the emotional wellbeing of the community has been referred to as the "second pandemic". Merging data has shown an increase in feelings of stress, anxiety, depression, insomnia, denial, anger, and fear. The aim of this project is to document the experience of living through the COVID-19 pandemic and to understand the impact of the pandemic on the stress, mental health, family functioning and financial hardship of Australian families.

Research method: Participants enrolled in The ORIGINS Project were sent online questionnaires monthly from April to July 2020. Standardised questionnaires were used to assess stress, family functioning, mental health, and financial hardship. Additional demographic, behavioural and qualitative questions related to employment, lifestyle behaviours, worries/challenges and enjoyable aspects were also included.

Results: 1639 responses were obtained across the four time-points. While only 14% of respondents indicated that their employment had been affected by the pandemic, the majority of respondents reported that they were worried regarding their current and future household finances. 38% of respondents indicated that their emotional health was worse in the previous few months compared to pre-COVID. However, only 20% of these respondents accessed support through a healthcare professional for their emotional wellbeing.

Conclusions: COVID-19 presents a significant risk to the mental health and wellbeing of Australian families. This information will be valuable to healthcare professionals and policy makers in planning and preparing for future infection waves or pandemics.

56 Intervention to increase children's activity levels through dog walking and dog play

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Background and aim: Even though most families own a dog, few children participate in dog walking and play. The PLAYCE PAWS study tested a minimal-contact, mobile health ('mHealth') intervention to encourage more family dog walking and play, and improve children's overall activity levels.

Research method: 150 children aged 5-8 years were assigned to either one of two intervention groups or a 'usual care' control group. Parents of the 'SMS' group received text messages over four weeks. The 'SMS and pedometer' group also received a dog pedometer and personalised 'dog steps' diary for the child. Parent-report measures included children's dog walking and play, overall physical activity, collected at baseline, one-month and three-months post intervention.

Results: Dog walking significantly increased between baseline and one-month follow-up for all groups (SMS 2.00 vs 2.73; pedometer 2.00 vs 2.55; control 1.40 vs 1.93; $p<0.0001$); and also between baseline and three-month follow-up for both intervention groups (SMS 2.73 vs

2.77; pedometer 2.55 vs 2.61; control decreased 1.93 vs 1.67; p=0.001) No significant changes were observed for dog play.

Conclusions: These preliminary results suggest the intervention is having a positive effect, which is sustained at three-months follow-up. However the control group also significantly increased in dog walking at one-month follow-up but this decreased at three-months follow-up. Further data will help determine if mHealth interventions encourage children to walk and play with their dog more and be more physically active. If effective, a larger trial or program could be implemented at low-cost and with wide reach in the community.

57 Defining the prevalence of tracheobronchomalacia in cystic fibrosis

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Introduction: Tracheobronchomalacia (TBM) remains difficult to define but is estimated to be present in 1 in 2100 children. Previous reports have suggested it is more common in children with cystic fibrosis (CF) with a prevalence of 15%. This has clinical implications with potential to influence lung health and airway clearance regimes.

Aim: To determine prevalence of TBM in children with CF in Western Australia.

Method: A retrospective review of medical records was undertaken in children with CF born between 2001 and 2016 and consented to the AREST CF Surveillance study. Operation reports from bronchoscopies performed under the age of four were examined. Data collected included documented observation of free breathing and the presence, persistence and severity of TBM. Method of presentation, symptoms at diagnosis and pancreatic status were extracted from the AREST CF database.

Results: Of 180 children born with CF, 169 met inclusion criteria. A total of 631 bronchoscopy reports were reviewed with observation of free breathing documented in 16.6%. Sixty eight children (41%) had TBM reported at least once, with TBM persisting for more than one bronchoscopy in 52%. Moderate to severe TBM was reported in 44%. Presence, persistence and severity of TBM were all significantly associated with meconium ileus, pancreatic insufficiency and gastro-intestinal symptoms at presentation.

Conclusion: The prevalence of TBM in our cohort appears higher than previously described and is likely underestimated due to infrequent observation of free breathing. Gastrointestinal manifestations of CF are associated with the presence of TBM.

Key words: Cystic fibrosis, Tracheobronchomalacia, Paediatrics

58 An observational study of Neonatal Intensive Care admissions using video footage

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Aim: To explore the admission process to our Neonatal Intensive Care Unit.

Research method: We utilised observational video recordings of a convenience sample of inborn admissions. Two remote GoPro cameras were placed, one giving an overview of activity and the other focussed on the infant. Recordings captured the first hour of life. Participants included any staff assisting with the admission, the neonate and any family present. Informed consent was obtained retrospectively for staff and prospectively for parents. The video footage of each case study was reviewed by a multidisciplinary panel using an agreed semi quantitative analysis of events.

Results: Ten admissions to the NICU were video recorded between June and October 2018. Gestational age 28^{2}- 40^{1}. Practices focused on maintaining airway support and monitoring was noted to be varied. Handover appeared fragmented. Admission temperatures were below the target range, median 36^{2} (35^{4}-37^{3}) ^{o}C. Vascular access and fluid management occurred at a median of 36 (13 – 67) minutes.

Conclusions: Planning and approval for this study was protracted, particularly negotiating the use of video recording. Anecdotally, this delay is thought to have contributed to an improvement in managing admissions, particularly when maintaining airway support and monitoring. However, our baseline data has highlighted varied practices, a fragmented handover, low admission temperatures and a broad time frame to achieve vascular access. A guideline to streamline handover and nursery transition is currently being implemented. A further cycle of improvement will be used for evaluation

59 Epidemiology of rare craniofacial anomalies in Western Australia: A population-based study.

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Objectives: To describe birth prevalence and antenatal and perinatal factors associated with rare craniofacial anomalies.

Methods: Live and still births between 1980 and 2010 with rare CFA [Craniosynostosis, hemifacial microsomia (HFM) and others (Treacher Collins, Van der Woude, Pierre Robin syndrome and cleido-cranial dysostosis)] were identified using the Western Australian Register of Developmental Anomalies. Information on antenatal and perinatal factors were obtained through linkage to the Midwives Notification System and Birth Register. Trends in prevalence adjusted for sex and race were investigated by negative binomial regression presented as annual percentage change (APC). Strength of association of related factors was assessed using multivariable logistic regression reported as odds ratio and 95% CIs.

Results: Of the total 714 infants born with rare CFA (1 per 1,110 births), craniosynostosis (1 per 1,894 births) was the most common contributing diagnosis. There was a temporal increase in prevalence of metopic synostosis [APC: 5.6 (2.3,9.0)] and Goldenhar syndrome [APC: 4.4 (1.9,7.7)]. Syndromic craniosynostosis and HFM were commoner among infants

born preterm, with growth restriction, to fathers aged 40 and older, to mothers undertaking fertility treatments and having underlying medical conditions. The odds of non-syndromic metopic synostosis [14.3 (2.0, 100.4)] were higher after 1996 compared to the previous period.

Conclusion: Findings indicate a steady increase in prevalence of metopic synostosis and Goldenhar syndrome. Possible associations of fertility treatments and voluntary folate fortification (introduced during 1996) with rare CFA require further investigation. Constant surveillance of rare CFA is required to monitor disease trends to develop potential prevention strategies.

Key words: Craniofacial anomalies, Rare disease, Epidemiology

60 Airway cysteinyl leukotrienes are not elevated in survivors of preterm birth

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Background and aim: Children born prematurely exhibit low lung function and are frequently diagnosed with asthma. However, it is unclear whether this is truly an asthma phenotype. Cysteinyl leukotrienes are inflammatory mediators and are elevated in exhaled breath condensate (EBC) of asthmatic children. We aimed to compare cysteinyl leukotriene levels in EBC between children and young adults born preterm and those born at term and assess whether cysteinyl leukotrienes related to disease severity.

Research method: EBC, exhaled nitric oxide (eNO) and spirometry measures were collected from 77 preterm (born <32 weeks gestation) and 31 term (born >37 weeks gestation) participants aged 6-23 years old. Cysteinyl leukotrienes in EBC were measured by enzyme-linked immuno-sorbent assay. Spirometry parameters were converted to z-scores using Global Lung Initiative reference equations.

Results: Cysteinyl leukotrienes were detected in 26/31 term and 58/77 preterm participants. Median (interquartile range) concentrations did not differ between preterm (168 pg/ml (22.0-248)) and term-born participants (227 pg/ml (131-271); p=0.11) and did not correlate with eNO or spirometry outcomes. eNO, a marker of eosinophilic inflammation, was not different between term and preterm participants, despite preterm participants having reduced FEV_1 and FEV_1/FVC ((mean ± SD) -0.58 ± 1.22, -0.83 ± 1.20 z-scores) compared to those born at term (0.11 ± 1.27, -0.28 ± 1.05z-scores; p<0.05).

Conclusions: Survivors of very preterm birth experience reduced lung function, however this was not correlated to cysteinyl leukotriene levels. Further analysis of inflammatory markers is needed to determine the underlying mechanism of disease in survivors of preterm birth.

61 Timing of first cuddle for preterm babies after introducing a Family Integrated Care model

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Education, 4 Curtin University School of Nursing, Midwifery and Paramedicine, 5 King Edward Memorial Hospital Department of Nursing and Midwifery Education and Research

Background: In 2017 a Western Australian neonatal intensive care unit. implemented a Family Integrated Care model to improve parent and newborn contact

Aim: A retrospective audit aimed to examine time to first cuddle between preterm babies (born <32 weeks) and their parent pre and post introduction of the model. Secondary outcomes included time to full feeds and length of neonatal intensive care stay.

Research method: A 'before-after' design compared outcomes for babies admitted pre (2015) and post (2018) implementation of the model. The audit included babies from two gestational age groups, born ≤ 27+6 weeks, and 28-31+6 weeks.

Results: 153 babies were included, 79 from 2015 (≤ 27+6 weeks n=39 and 28-31+6 weeks n=40) 74 from 2018 (≤ 27+6 weeks n=35 and 28-31+6 weeks n=39). Babies from 2015 and 2018 were born at similar median gestational ages with comparable birthweights. Babies born ≤ 27+6 weeks in 2018 were cuddled earlier (median =141 hrs old) compared to those in 2015 (median =157 hrs old). Median time to reach full feeds decreased and was significant in the ≤ 27+6-week group: 288 hrs (12 days) in 2015 to 207.5 hrs (8.6 days) in 2018. Length of NICU stay was not shorter in 2018 compared to 2015 for both gestational groups.

Conclusions: Family Integrated Care models may decrease the time to first cuddle and full feeds. Further research on outcomes such as breastfeeding, infant weight gain and length of stay can build knowledge in this area.

62 Are continuous glucose monitors useful in monitoring of children with persistent hypoglycaemia?

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Background: Glucose monitoring is vital in children with persistent hypoglycaemia to reduce the risk of adverse neuro-behavioural outcomes. Continuous glucose monitoring (CGM) provides real-time glucose levels; however information on its usefulness in monitoring glucose levels in this cohort is limited.

Objective: To ascertain the effectiveness of CGM and to evaluate parents' experience of using CGM for monitoring glucose levels in children with hypoglycaemia.

Methods: Retrospective analysis of sensor glucose (SG) values from Dexcom G4 CGM system with paired finger prick blood glucose (BG) values was performed to determine accuracy of CGM. Parent experience of CGM was assessed using a questionnaire.

Results: SG data from 41 children (Median age 6 months) with persistent hypoglycaemia (63% Hyperinsulinism) were analysed. The mean difference between 5,650 paired BG and SG values was 0.28mmol/L. There was a positive correlation between the two methods. (r=0.79). The sensitivity and specificity of CGM to identify severe hypoglycaemia (BG<3.0

mmol/L) were 54.3% and 97.4%; respectively. The positive predictive value for detecting severe hypoglycaemia was 16.0% while the negative predictive value was 98.5%. Parents (n=9) reported lesser anxiety (n=8), better sleep at night (n=6) and preferred to use CGM for monitoring (n=8).

Conclusion: The high number of false positive readings limits the role of CGM in routine evaluation of hypoglycaemia but avoids unnecessary BG testing during normoglycaemia and has the ability to detect severe hypoglycaemia. It is an acceptable tool to parents in monitoring their children who are at risk of hypoglycaemia.

63 Identifying cognitive impairment through *Early Moves*

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Background and aim: Very early detection of risk of cognitive impairment would allow access to early interventions and promote improved long term outcomes for children and their families. *Early Moves* seeks to identify if General Movements (GMs) can act as an early biomarker for cognitive impairment.

Research method: *Early Moves* (ORIGINS sub-project) is a prospective cohort study of 3,000 babies born in metropolitan Perth. GM outcomes at writhing (1-5 weeks post term) and fidgety (12-17 weeks post-term) stages will be combined with routinely collected health data to develop screening algorithms for risk of cognitive impairment, as assessed at age two years on the Bayley-4. 500 babies have been recruited since commencement in November 2019. The study will finish in late-2025.

Results: Interim results on first 290 babies shows mean gestation is 38.8±1.6 weeks (29.7-41.7 weeks). Rate of video submission is 70% for writhing and 76% for fidgety. 88% and 89% of videos were scorable for writhing and fidgety periods respectively.
64% of writhing videos were classified normal (Median Optimality Score=35, P75=38, P24=33), while 32% were classified poor repertoire (Median Optimality Score=24, P75=28, P24=20). 98% of fidgety videos were classified as normal, and the median Movement Optimality Score was 26 (P75=26, P25=24).

Conclusions: Video submission rate was lower than anticipated, though rate of scorable videos is above targeted. GMs of the majority of babies classified with abnormal writhing had normalised by fidgety age. 2% of babies showed abnormal results at fidgety age and were referred to Early Intervention services at PCH.

64 Perceptions of General Paediatric Registrars following implementation of a new roster

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Background and aim: In 2019 the Department of General Paediatrics (DGP) at Perth Children's Hospital (PCH) switched from a day and night float to a distributed rostering

system with increased registrar numbers. The primary aim of this study was to explore the educational experience of DGP registrars in the new and previous rotations with respect to consultant supervision, feedback and access to educational activities. The study aimed to explore educational barriers and enablers in the after hours setting.

Research method: The study is a descriptive study design with mixed methods data collection and triangulation. Parameters evaluated consultant supervision, feedback, access to educational activities and overall teaching value. Quantitative data was collected using End-Of-Term Evaluation (EOTE) questionnaires from 2015-2019 and analysed using non-parametric comparative tests. Qualitative data were collected using focus groups, document review and unstructured answers to EOTE and analysed using inductive thematic analysis.

Results: A total of 69 EOTE questionnaires were analysed (response rate 69/132, 52%). DGP Nights respondents reported significantly lower mean ranks to Consultant "Level of Supervision" (p=0.040), Accessibility to "Tuesday CPC" (p=0.047) and "Departmental Seminars" (p=0.037), "Availability of Sessions" (p=0.037), "Ward rounds within working hours" (p=0.001) and "Recommend to Colleagues" (p=0.000). Twenty-five registrars participated across six focus groups. Themes emerged; "Carrying the load", "A(n un)supported environment", "Taking on a leadership role", "Accessibility of teaching" and "Disjointed".

Conclusions: Consultant supervision and autonomy were viewed as strengths of the rotations. A lack of safety relating to basic needs, high workload, variable peer support and poor accessibility to teaching were seen as barriers to learning, particularly in the after hours setting.

65 A smartphone application to support the wellbeing of children with cystic fibrosis

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Background and aim: Young people with cystic fibrosis (CF) may be at increased risk of social isolation and mental illness. This study aimed to design and evaluate the usability and acceptability of a smartphone application (app) to support the social connectedness and wellbeing of young people living with CF.

Research method: Young people with CF aged 12 to 17 years attending CF clinics at two paediatric hospitals in Australia piloted the app for six weeks before completing a survey about the app's acceptability and usability. Online interviews were conducted with a sub-sample of participants to determine the app's perceived strengths and weaknesses, and recommended changes.

Results: The app was rated highly usable and moderately acceptable by participants. Participants agreed that they learnt to use the app quickly (91%) and that it was easy to use (86%). Changes suggested by participants included accessing the chatroom from within the app rather than being directed to an external website and personalising the app's images and videos.

Conclusions: Interventions that improve young people's psychosocial health are vital in addressing the social isolation and mental illness often experienced by young people with CF. Changes recommended by study participants to improve the CF app will be incorporated into the app before it is distributed more widely. Further research is needed to test the efficacy of the CF app on users' social connectedness and wellbeing.

Key words: cystic fibrosis, wellbeing, technology

66 Adolescent screening in the context of transitioning to adult health services

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Background and aim: Adolescence is a period of increased risk-taking behaviour that can be prevented by engagement in early psychosocial screening. Young people should be treated in an appropriate setting and the failure to transition to adult-oriented health services can have detrimental repercussions on long-term health outcomes. It is expected that adolescents commence this screening and transition process between 13 and 18 years of age.

Aim: To assess what proportion of adolescent outpatients have undergone psychosocial screening and preparation for transition to adult-oriented health services as per the recommended guidelines.

Method: A retrospective audit looking at general outpatients at Perth Children's Hospital of age 16 with appointments between January 1, 2017, to December 31, 2019. 45 patients were randomly selected, and their files were reviewed for the presence of (1) Transition Readiness Checklist (TRC), (2) documentation of a HEADSS psychosocial screening (3) documentation that the young person was seen by themselves.

Results: One patient had a TRC in their file, and 15.6% of patients were seen alone during consultation and thus did not meet the standard. Analysis of HEADSS screening revealed 17.8% completion with 33.30% partially complete screens, which did not meet the standard

Conclusions: Adherence was poor and could be improved by implementing a separate tab in patient files for transition, creating an electronic HEADSS system to be filled out by the young person, and modifying the system programmer to send reminders for specific appointment types. This topic should be reaudited to assess the success of the recommendations.

67 The 5th pillar: Molecular profiling-based cancer therapy

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Background and aim: Management of refractory cancer is an enormous challenge, with limited standard of care options. Understanding disease biology is crucial in establishing an accurate diagnosis, assessing risk, personalising therapy and monitoring disease response. We demonstrate benefits of a molecular approach in a boy with primary refractory leukaemia, following treatment for cytogenetic-risk-neutral acute myeloid leukaemia.

Research method: The primary refractory bone marrow sample underwent whole genome (paired somatic and germline) and transcriptome (somatic) sequencing on the PRISM (Precision Medicine for Children with Cancer) trial platform.

Results: Somatic molecular features were consistent with an undifferentiated leukaemia, of mixed myeloid and primitive T-cell lymphoblastic lineage. Genomic alterations included a pathogenic *PHF6* mutation with associated low RNA expression; *RUNX1-EVX1* fusion; high RNA expression of *CRLF2, JAK2, JAK3*, *STAT PIK3CB, IKZF2* and *XBP1* genes and a germline heterozygous MUTYH mutation. These findings helped inform haemopoetic-stem-cell-transplant (HSCT) conditioning, with inclusion of total body irradiation and thiotepa alongside cyclophosphamide to counter the lymphoblastic component. Identification of *JAK/STAT* activation provides an option for targeting acute steroid-resistant graft-versus-host-disease with a tyrosine-kinase-inhibitor like ruxolitinib. The genomic profiling data enabled development of a PCR-based lymphoblastic marker for minimal residual disease (MRD) quantification. Germline findings did not impact BMT strategy, for either the HLA (human-leucocyte-antigen)-matched sibling donor or recipient. The patient remains in remission 50 days post-HSCT.

Conclusions: Molecular profiling clarified diagnosis, informed prognosis, helped individualise therapy, enabled MRD monitoring and triggered a familial cancer genetics referral, influencing several aspects of this child's complex leukaemia management, to a degree beyond the reach of conventional approaches.

68 Rapid Molecular Testing for Strep A Pharyngitis in a Remote Australian Setting

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Background and aim: Strep A (Group A streptococcus) pharyngitis is common and is the antecedent infection for subsequent acute rheumatic fever (ARF), and rheumatic heart disease (RHD), diseases which disproportionately affects remote living Australians. Early treatment requires rapid diagnosis, but this can take several days in remote settings. Point of care (PoC) Strep A molecular tests are now available enabling results in <6 minutes, however their use in remote settings has not been evaluated. We aimed to test the practicality of incorporating a rapid, molecular method for diagnosing Strep A pharyngitis in a remote research setting as part of our ongoing surveillance activities.

Research method: We tested PoC within our surveillance study set in two Kimberley schools. Over one week, 120 children were screened for pharyngitis. Pharyngeal swabs

were collected from symptomatic children for testing with the ID NOW machine (Abbott Laboratories) and standard culture for Strep A.

Results: Strep A was rapidly identified by PoC testing in 13 (72%) of 18 symptomatic children. Pharyngeal swab culture failed to detect Strep A in 3/13 children positive for PoC, suggesting greater sensitivity with molecular methods. All PoC negative children were also negative for culture. Study staff reported advantages to rapid diagnosis including being able to notify the child's caregivers and explain the requirement for antibiotic treatment in a timely manner.

Conclusions: We report the first use of a molecular test for Strep A in a remote setting. It was easy to use, had high field-based utility and should progress towards implementation into usual care.

69 Early-life predictors of lung function trajectories in the Raine Study

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Background and aim: Early-life lung function predicts later lung function. Genetic and early-life factors can alter baseline lung function resulting in trajectories that reflect poorer lung health. We aimed to characterize lung function trajectories in the Raine Study and investigate early-life predictors related to low lung function trajectories.

Method: We investigated 1512 participants from the Raine Study with at least two spirometry measurements. Lung function trajectories for FEV_1, FVC and FEV_1/FVC (z-scores) were identified using group-based trajectory modelling for data available from the 6, 14- and 22-year follow-ups. Multivariable analysis for risk factors at age 6 and parental risk factors, such as current asthma and maternal smoking, was assessed using multinomial logistic regression.

Results: We identified four lung function trajectories for FEV_1, FVC and FEV_1/FVC. Positive associations were found between the lowest trajectories of FEV_1 and childhood asthma ($p=0.024$), asthma ever ($p=0.006$), and lower respiratory tract infections in the first year of life ($p=0.029$). Childhood wheeze was associated with the low trajectory and, surprisingly, with the above average trajectory of FVC ($p=0.020$ and $p=0.042$, respectively). Childhood asthma was associated to the very low, low-high and high-low trajectory of FEV_1/FVC ($p<0.03$). Early environmental exposure to $PM_{2.5}$ and NO_2 was not associated with lung function trajectories.

Conclusions: A group of the population followed a persistently low lung function trajectory, characterized of having childhood and respiratory tract infections. These findings suggest that early childhood may be critical windows of opportunity for prevention of long-term consequences of childhood asthma on lung health.

Key words: Respiratory health, lung function, early-life

70 Family dog ownership is associated with increased pre-schooler physical activity.

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Background and aim: Childhood obesity and physical inactivity are major public health issues. Almost every second household in Australia has a dog. Dog ownership leads to greater physical activity in adults and school-aged children. We examined if dog ownership and dog-facilitated physical activity was associated with higher physical activity in pre-schoolers (2-5-year-olds).

Research method: A secondary data analysis of the 'Play Spaces & Environments for Children's Physical Activity' study cohort (2015-2018) was undertaken. Data was collected for 1366 children 2-5 years from 122 long day-care centres in Perth, Australia. Parent-report surveys measured socio-demographic factors, dog ownership, child-dog play and dog walking, structured and unstructured physical activity and screen time as well as objectively measure physical activity and sedentary time.

Results: Compared with non-dog owners, dog-owning pre-schoolers did 8 times/week more unstructured physical activity but 6 minutes/day less park play (both $p<0.05$). Dog-owning pre-schoolers who played with their dog ≥3 times/week did 0.5 times/week more structured physical activity, 12.5 times/week more unstructured physical activity, 39 minutes/day more outside play and had 16 minutes/day more sleep (all $p<0.05$). Pre-schoolers who walked their dog ≥3 times/week did 0.5 times/week more structured physical activity, 10.5 times/week more unstructured physical activity, 31 minutes/day more outside play and 17 minutes/day less screen time (all $p<0.05$).

Conclusions: Findings suggest the greatest physical activity related benefits from having a family dog come from when young children spend time playing with their dog and going on family dog walks.

71 Iron deficiency anaemia management at Princess Margaret Hospital (PMH) /Perth Children's Hospital (PCH)

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Background and aim: Iron deficiency anaemia is common with a prevalence of approximately 8% in Australian children under age 5 years. Iron deficiency alone or with anaemia can affect cognitive development and is therefore important to treat. The commonest cause in the paediatric population is nutritional. Dietary counselling and oral supplementation are required.

The aim of the study is to review the efficacy of treatment of iron deficiency anaemia with or without anaemia at our institution over a three year time period, compared against gold standard as defined by Australian national consensus guidelines.

Research method: This study is a retrospective case study of 140 cases of iron deficiency with or without anaemia treated by medical teams at PMH/PCH between January 2016 and

December 2019. Cases were randomly selected from the PathWest database of children aged between 6 months and 17 years with a low ferritin level. Cases were only included if they had at least two ferritin levels recorded. Children with gastrointestinal, renal, rheumatological, other haematological or malignant disorders were excluded. Data were collected from the medical charts to determine demographics, diagnosis and treatment outcomes.

Results: We anticipate 90% of patients selected with iron deficiency anaemia to have resolution by 3 months. Preliminary results suggest that there is a higher degree of treatment failure within this institution.

Conclusions: Treatment of iron deficiency with or without anaemia does not meet Australian national consensus guidelines at our institution. These results will be used to inform further study and the writing of an iron deficiency management protocol for CAHS.

72 Barriers to influenza vaccination of children hospitalised for acute respiratory illness

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Aim: to identify barriers to influenza vaccination of children hospitalised for acute respiratory illness (ARI) in Australia.

Methods: 595 parents of children hospitalised with ARI across five tertiary hospitals in 2019 participated in an online survey. Multivariate logistic regression identified factors most strongly associated with influenza vaccination barriers.

Results: odds of influenza vaccination were lower with lack of health care provider (HCP) recommendation (adjusted odds ratio (aOR) 0.18; 95% CI: 0.08–0.38); if parents had difficulties (aOR 0.19; 95% CI: 0.08–0.47) or were 'neutral' (aOR 0.23; 95% CI: 0.06–0.82) in remembering to make an appointment; and if parents had difficulties (aOR 0.21; 95% CI: 0.07–0.62) or were 'neutral' (aOR 0.24; 95% CI: 0.07–0.79) regarding getting an appointment for vaccination. Odds were also lower if parents did not believe (aOR 0.27; 95% CI: 0.08–0.90) or were 'neutral' (aOR 0.15; 95% CI: 0.04–0.49) regarding whether the people most important to them would have their child/ren vaccinated against influenza. Children had lower odds of vaccination if parents did not support (aOR 0.09; 95% CI: 0.01–0.82) or were ambivalent (aOR 0.09; 95% CI: 0.01–0.56) in their support for influenza vaccination. Finally, lack of history of influenza vaccination of child (aOR 0.38; 95% CI: 0.18–

0.81) and respondent (aOR 0.25; 95% CI: 0.11–0.56) were associated with lack of receipt of influenza vaccine before admission for acute respiratory infection.

Conclusions: assisting parents in remembering and accessing influenza vaccination and encouraging HCPs to recommend vaccination may increase uptake.

Key words: Influenza, Vaccination, Health Knowledge, Attitudes, Practice

73 Flash Glucose Monitoring in children with Type 2 diabetes.

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Background and aim: Flash glucose monitoring (FGM) and continuous glucose monitoring (CGM) use in paediatric type 1 diabetes (T1D) has led to improved clinical outcomes and quality of life (QoL). CGM is now standard care for children with T1D, with free access. There is limited data of its clinical impact in paediatric type 2 diabetes (T2D), a disease associated with early onset of metabolic complications. This cohort typically performs minimal self-blood glucose monitoring. The primary aim was to assess the feasibility of FGM technology, using an intermittently-scanned interstitial glucose sensor changed fortnightly over 12 weeks, in children with T2D. Secondary aims include changes in diabetes self-management and optimising glycaemic control.

Research method: A pilot study utilising qualitative and quantitative methodologies for up to 12 participants, 4-18 yrs, > 6 months from diagnosis and HbA1c >6.5%. Technology use was assessed by number of daily scans, input of dietary and exercise events and ability to manage device insertion. Diabetes self-management education was provided using downloaded sensor data at 3 time points. We assessed QoL, diabetes treatment satisfaction, CGM satisfaction and a semi-structured, audio-recorded interview. Anthropometric and routine diabetes clinical data was collected.

Results: We recruited 8 participants, mean age 15.3 yrs (13-17), 5 males, BMI 35.6 kg/m^2 (22.6 – 49.1) and HbA1c 10.1% (7.3-17.5). Preliminary outcomes at 12-week time point will be presented.

Conclusions: We aim to describe the feasibility and impact of FGM as an adjunct to standard clinical care in paediatric T2D, which will inform future research questions for larger studies.

74 Recovery from anaesthesia and sedation in children undergoing elective medical procedures

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Background and aim: Sedation and anaesthesia are used in children to relieve pain and ensure cooperation during medical procedures. However, there is currently limited evidence about the recovery trajectory. The primary aim was to describe severity and duration of postoperative pain, nausea and vomiting after common diagnostic and medical procedures. Secondary outcomes include return to baseline functioning and post-procedural medical representation.

Research method: Families of children undergoing botox injection, bronchoscopy, either or both colonoscopy or UGI endoscopy, or MRI were invited to participate via telephone. Daily pain scores, nausea and vomiting, administration of at-home analgesia and adverse events requiring medical attention were recorded. Children were followed until pain completely resolved and baseline activity resumed.

Results: 307 patients were included. Pain scores peaked on day of procedure across all groups and decreased over time, with most children resuming normal level of activity within 1 day postoperatively. Pain in botox injection (10% moderate to severe vs 22% mild), bronchoscopy (8% vs 10%) and MRI (0% vs 2%) groups were mostly mild and resolved quickly. Combined UGI endoscopy and colonoscopy was associated with greatest pain severity (29% moderate to severe vs 20% mild) and duration (0-2 days). Highest rates of nausea and/or vomiting were observed in colonoscopy (23%), UGI endoscopy (28%) and combined procedure groups (20%). Medical re-presentations were infrequent across all groups.

Conclusions: This study demonstrates that recovery trajectory following procedural sedation and anaesthesia is short, with few adverse events and minimal requirement for additional medical attention. These findings allow provision of education and aid in alleviating parental anxiety.

75 Barriers and facilitating factors for families accessing a tertiary family-based treatment program for childhood obesity

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Background: Recent studies have highlighted the need to obtain parents' and children's ideas to optimise the design of family-based therapies for children's weight loss. This research sought to investigate the opinions of parent and child/adolescents who were referred to or attended a clinical hospital-based childhood obesity program. This study had two main aims. Firstly, to investigate barriers to health-related behaviour change. Secondly, to determine the program design features that would be most desirable and best support families.

Research method: Participants were recruited from the Perth Children's Hospital Healthy Weight Service, between March 2016 – May 2018 (*N*= 157). Thirteen families were interviewed during October 2017 to June 2018 (7 parent-only, 6 parent/child, 1 adolescent-only).

A semi-structured qualitative interview guide was developed. Audiotapes were reviewed by the first author and transcribed verbatim. Data analysis was conducted using the inductive thematic approach. The transcriptions were coded for meaning, similarities and differences.

Results: Participant demographics and key themes will be presented.

Conclusion: Obesity is complicated and multifaceted, and childhood obesity is more complex due to the interacting roles of parents/caregivers and the child/adolescent. Seeking consumer feedback and opinions may highlight barriers for families that are not addressed by the design of the current clinical childhood obesity program. Whilst clinical childhood obesity programs are addressing some of the themes found in this study, there remains a significant challenge to engage, motivate and elicit behaviour change in participating families to optimise child health BMI outcomes.

76 Systematic review - functional outcome measures in cerebral palsy having gait correction surgery.

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Background and aim: Improving function in daily life is a crucial goal for children with cerebral palsy (CP) and parents after orthopaedic surgery. Best measures to assess the effect of surgery on the child's level of activity and participation are limited. This systematic review aimed to identify non-instrumented measures used in a clinical setting to assess improvement in activity and participation after orthopaedic surgery for gait correction in children with CP.

Research method: Four databases (PubMed Embase, EmCare, MEDLINE) were searched. Eligibility criteria included children with CP having surgery for gait correction with non-instrumented measures to assess outcome. The Methodological Index for Non-Randomized Studies (MINORS) was used to appraise and determine the quality of the studies. The review was registered with PROSPERO (CRD42020155990).

Results: The search yielded 547 articles of which 37 met eligibility criteria. The MINORS score for comparative studies (n = 9) was median =18/24, range = 12-22; non-comparative studies (n =25) was median = 12/16, range 6-14. Functional Mobility Scale was the outcome most used (40.5% of included studies). Health Related Quality of Life outcomes were reported in 27% of studies. Gait velocity and energy cost of walking were measures chosen by 24% and 27% studies respectively. Only 8% of studies used objective observational rating scales for improvement in gait quality.

Conclusions: There was limited use and variability in outcomes used to measure activity and participation in children with CP having gait correction surgery. This makes it difficult to determine the best outcome measure to use.

77 Less than 40% of front-line workers pass fit-testing for standard N95/P2 masks

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Background and aim: Staff exposed to aerosol generating procedures are at a particularly high risk of airborne disease transmission and appropriate respiratory protection is vital. The aim of this audit was to assess the adequacy of respiratory protection of staff routinely exposed to aerosol generating procedures. We therefore audited the fit-pass rates of N95/P2-masks available at Perth Children's Hospital.

Method: Staff from the Department of Anaesthesia and Pain Medicine opted to undergo privately organised qualitative and/or quantitative fit-testing of N95/P2-masks. Staff completed a short questionnaire regarding prior N95/P2-mask training and the confidence and knowledge gained through fit-testing. Fit-testing was performed following standard guidelines, including a fit-check. The type and size of mask, including whether tape was used, pass or failure and duration of fit-testing were recorded.

Results: 84 staff participated. Prior to COVID-19, only 7/84 (8%) staff members had formal N95/P2-mask training whereas 69/84 (82%) had their first formal training during the emergence of the pandemic. Confidence "that the available mask will provide adequate fit" was higher after fit-testing compared with before fit-testing (median, IQR) 5-point Likert-scale [4.0(4.0-5.0) vs 3.0(2.0-4.0), $p<0.001$]. The first fit-pass rate using un-taped available N95/P2-masks at the institution (in line with routine use) was only 39%, leaving over 60% of staff insufficiently protected.

Conclusions: Less than 40% of staff were appropriately protected from aerosolised particles without fit-testing. This highlights the urgent need for healthcare services to provide staff, particularly those regularly exposed to aerosol generating procedures, with regular fit-testing and a wider range of masks.

Key Words: COVID-19, masks, fit-testing

79 Targeting transcription factor Lyl1 in Early Thymocyte Progenitor Acute Lymphoblastic Leukaemia.

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Background and aim: Early thymocyte progenitor acute lymphoblastic leukaemia (ETP-ALL) is a poor risk form of T cell ALL. Patients have increased risk of relapse and need for salvage therapies including stem cell transplantation. ETP-ALL have a distinct mutational

profile with increased expression of transcription factors LYL1 and LMO2. We aim to determine if these factors can be targeted as a form of therapy for T-ALL in a mouse model.

Research method: A transgenic mouse model of ETP-ALL the $Lmo2^{tg}$ mice were used in our study. These mice developed T-ALL at a median time of 10 months. We previously showed that the development of leukaemia on these mice was dependent on the presence of Lyl1. We specifically developed a novel Ert2cre:Lyl1 conditional knockout mice which were then crossed with the $Lmo2^{tg}$ mice to facilitate our study.

Results: Ert2cre:$Lmo2^{tg}$:Lyl1 conditional knockout (E:Lmo2:Lyl1-cko) mice developed leukaemia at a median of time of 10 months similar to $Lmo2^{tg}$ model. Thymocytes from these mice also demonstrated stem cell-like abilities and repopulated the thymi of transplanted mice. Leukaemia harvested from these mice caused leukaemia death in transplanted mice, with deletion of Lyl1 showing improved survival. We also identified partners proteins in the Lyl1 protein complex in T-ALL and identified a number of potential 'druggable' targets.

Conclusions: Targeting Lyl1 in shows efficacy in a mouse model of ETP-ALL and warrants further investigation.

80 Consumer engagement in antibiotic allergy research: A diverse communication strategy pays off.

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Background and aim: The aim of our project was to deliver a range of community engagement activities designed to connect with participants of the SPECIAL (Safely Preventing Errors and Complications due to Inappropriate Allergy Labelling) Kids Study, and to raise awareness about the importance of evaluating suspected childhood antibiotic allergy.

Research method: Members of the SPECIAL Kids research group met with communication teams from PCH, UWA and the Consumer & Community Health Research Network. Following this consultation, a strategy was planned. With our Partners, we designed webpages at PCH and UWA; these describe our research, and facilitate community contact. We held an informal Meet the Researcher event for participants to meet and address questions to the research team; convened the inaugural consumer event at the 2020 Perth conference of the Australasian Society for Clinical Immunology and Allergy; a Consumer Community Conversation at the State Library; and produced an educational video.

Results: The digital communication strategy had the most reach and the PCH Facebook post reached 10,000 people with 800 users actively engaging, resulting in an 18% average increase in study referrals. Despite inviting 500 research families to the Meet the Researcher event, only 6 families attended. The Community Conversation saw 15 registrations and 9 attendees, whilst the consumer/expert panel discussion at the conference had 100 medical and non-medical attendees. The educational video resulted in 3 versions accessible online.

Conclusions: Diverse communication strategies, in collaboration with stakeholders, are required to engage with a wide section of the community in research.

81 A pathway to efficient data-driven decision making

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Health care, like most other industries, currently collects and stores an exponentially increasing amount of data. Many elements of clinical management are supported by a limited evidence base, so there is a real focus on extracting information and value from the increasingly broader/deeper datasets that are collected, as a means to inform clinical practice. Access to more data often brings more complexity into the data analysis.

A key role in any health research project team is the biostatistician (data analyst/data scientist), who brings a unique skillset to the table and often assists in making critical decisions during project planning – like specifying the research question - as this has a direct flow on effect to the analytical techniques used to analysis the data and the subsequent language used to communicate the project's findings. Biostatisticians often have the challenge of understanding a domain that is new to them and understanding the nature of measures they have never worked with before, and researchers are often looking for support within short timeframes. Health research is facing a reproducibility crisis, it is more vital now than ever before that we pause and ensure data analysis plans are robust and appropriate for the research question being asked to avoid adding more noise into the literature.

We propose five ideas for researchers to think through prior to meeting with a biostatistician, in the aim of achieving maximum efficiency of initial consultations and engagement, so to expedite the projects data analysis and reporting.

82 Acquisition of motor skills and seizures in three developmental encephalopathies

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Background: MECP2 duplication syndrome (MDS) remains a poorly characterised intellectual disability disorder that holds considerable clinical overlap with other developmental epileptic encephalopathies including Rett syndrome (RTT) and CDKL5 deficiency disorder (CDD). The aim of this study was to compare the acquisition of sitting, walking and onset of seizures across MDS, RTT and CDD.

Method: Data was collated from the MECP2 Duplication Database (MDBase, n=131), InterRett (n=619), the Australia Rett Syndrome Database (n=289) and the International CDKL5 Disorder Database (n=333). Time-to-event survival analysis was used to estimate the median age of motor skill development and seizure onset across the three disorders.

Results: The median age for acquisition of sitting in individuals with MDS was 12 months, later than 8 months for those with RTT but earlier than 60 months for those with CDD. Half of individuals with MDS acquired walking when just over 4 years, later than 2.5 years for those with RTT and again earlier than in CDD where only a quarter could walk by just under 8 years. Half of individuals with MDS developed seizures by 8 years with earlier onset of 5 years in RTT and even earlier onset at 1.5 months in CDD.

Conclusions: Delay in acquisition of developmental milestones in MDS was of intermediate severity compared with RTT and CDD. Further characterization of comorbidities and phenotype in MDS is required for a better comparison with RTT and CDD.

83 Peri-operative paediatric tonsillectomy analgesia. A review of practice and cost effectiveness analysis.

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Background and aim: Tonsillectomy is one of the most common paediatric surgeries and results in considerable pain. Insufficiently controlled pain is costly and risks physiological and psychological consequences with multi-modal analgesia recommended to minimise opioid based agents. We determined adherence to institutional analgesia guidelines and assessed cost effectiveness.

Research method: We assessed practice over two discrete 6 week periods. We reviewed use and route of administration of paracetamol, ibuprofen and/or parecoxib during the pre, intra and immediate post-operative period. Costs were analysed using the hospital drug formulary.

Results: 110 patients were reviewed. Of those with a paracetamol prescription, 60.5% received it during the specified peri-operative period; 17.4% received oral paracetamol pre-operatively, 40.4% received intravenous (IV) paracetamol intra-operatively and 2.8% received oral paracetamol in the post-anaesthesia care unit (PACU). Of those with a prescription of a non-steroidal anti-inflammatory drug (NSAID), no patients received ibuprofen pre, intra-operatively or in the PACU. IV parecoxib was administered to 87.6% intra-operatively and 0.92% in PACU. Paracetamol and NSAIDS were not given until return to ward for 39.4% and 11.4% respectively.

Conclusions: We demonstrated sub-optimal use of multi-modal analgesia for tonsillectomy patients in the immediate perioperative period and highlighted a reliance on IV analgesic formulations. By introducing a model of pre-operative combination oral premedication, we hypothesise this will enhance peri-operative analgesic efficacy and reduce opioid administration. Furthermore, by converting to oral premedication rather than intra-operative IV dosing, potential savings equate to approximately $14 per patient which could potentially save millions.

84 Improving wellbeing for young people living with rheumatic heart disease through peer support

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Background and aim: Aboriginal and Torres Strait Islander people in Australia have an inequitable burden of acute rheumatic fever (ARF) and rheumatic heart disease (RHD), concentrated among young people and necessitating ongoing medical care during adolescence. There is an unmet need for improved wellbeing and support for these young people to complement current biomedical management. This pilot initiative aimed to determine the suitability and appropriate format of an ongoing peer support program to address the needs of young people living with RHD in urban Darwin.

Research method: The content of each peer-support session was developed in consultation with Danila Dilba Health Service (DDHS) staff and RHDAustralia. Each session included cooperative play (e.g. icebreaker games), an educational component (e.g. hand washing, heart anatomy, skin sore awareness), a support component (e.g. conversations about participants' experiences of RHD), a snack or meal break, and a brief session evaluation.

Results: Five participants took part in three sessions. Evaluation findings demonstrated the peer-support setting was conducive to offering support and enabled participants to share their experiences of living with RHD with facilitators and each other. Satisfaction rates for each session, including both educational components and support activities, were high.

Conclusions: Learnings from the pilot program can inform the following elements of an ongoing peer-support program: characteristics of co-facilitators and external presenters; program format and session outlines; possible session locations; and resourcing.

85 Neonatal lung disease predisposes children with cerebral palsy to later respiratory disease

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Background and aim: Respiratory disease is the leading cause of death in people with cerebral palsy (CP). Previously identified risk factors for respiratory disease in CP include motor severity (Gross Motor Function Classification Scale Level V), dysphagia, comorbidities (epilepsy, reflux and nightly snoring) and past history of respiratory admission(s). It is not known whether chronic neonatal lung disease (CNLD) poses additional risk to children with CP, 40% of whom are born prematurely.

This research aims to examine whether preterm infants with CP are at higher risk of childhood respiratory hospital admissions if they had CNLD.

Research method: ncluded were all children with CP born in WA from 1986 to 2015 (n=1926). The WA Data Linkage Unit linked data from Neobase, WARDA-CP, WA Births Registrations, Midwives Notifications, and the Hospital Morbidity Data Collection. Multivariable regression (negative binomial) was used to examine associations between risk factors and number of respiratory admissions.

Results: Children with CP had 2.5 times more respiratory-related hospital admissions (after controlling for age, epilepsy, speech impairment and tube feeding) if born very preterm (<32 weeks gestation) (IRR 2.5, 95% CI: 2.0 to 3.0, p<0.001) This rate increases to 3.4 for those with CNLD (IRR 95% CI: 2.6 to 4.5, p<0.001).

Conclusions: Preterm birth combined with CNLD is associated with increased risk of respiratory hospitalisations.

Perinatal and neonatal events should be considered when assessing respiratory health in CP.

86 Parents' experiences of accessing mental and medical health services for their trans or gender diverse child: An exploratory mixed methods study

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Background and aim: Trans and gender diverse (TGD) is an umbrella term used to describe people whose gender identity differs from their birth-assigned sex. Some TGD youth seek gender-affirming medical intervention which includes puberty blocking hormones, gender-affirming hormones (e.g. testosterone, oestrogen) and/or surgeries. TGD youth experience higher rates of mental health difficulties than the general population. TGD youth and their parents face many barriers in accessing gender-affirming care and mental health support. This study aims to explore parents' experiences of accessing medical and mental health services with their transgender child.

Research method: This is a mixed-methods study utilising data collected via a national online survey including questions on medical and medical health access and mental health diagnoses. Participants were 194 parents of TGD young people (aged 25 or younger). Quantitative analyses include frequency of access to services and rates of mental health diagnoses received by TGD youth, and service satisfaction (as measured on a Likert scale). Qualitative results report on a thematic analysis used to explore the open-ended questions around parents' experiences of the services accessed with and for their child.

Results: Findings reflect barriers and facilitators to parent's service experience for and with their child. Specific rates of access, satisfaction, and major themes resulting from the analysis will be presented.

Conclusions: This novel study provides insight into the experiences of accessing TGD youth and their families accessing services. Results can aid in understanding barriers and facilitators to service access for TGD young people and their parents in Australia.

88 Regional transcriptional differences during *in vitro* rhinovirus infection in lung allograft recipients.

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Background and aim: Lung transplant (LTx) recipients are at risk of complications from common respiratory virus infection including rhinovirus (RV). Here, we profiled the gene expression of large and small airway epithelial cells (referred as LAEC and SAEC, respectively) from *in vitro* RV infection and non-infected. To establish new insights into the molecular mechanisms during this event.

Research method: Matched primary LAEC and SAEC obtained from LTx recipients (n=4, 45±8.1 years; 1 male) were established in cultures and inoculated with RV at MOI 12 for 24 hours. Next, dual RNA-seq approach was used to determine the viral load and host's gene expression profile.

Results: Meta-transcriptomics analysis confirmed RV infection. Gene expression profile for non-infected LAEC and SAEC identified pro-inflammatory signatures of Interleukin (IL)-17 signalling and surfactant metabolism, respectively. Comparison of the infected LAEC and SAEC to the non-infected counterparts has identified common and unique genes in response to RV infection. Pathway enrichment analysis of common genes showed conservative antiviral responses, as IFN and TLR signalling. Additionally, unique genes in LAEC showed strong signature related to interleukin-1 signalling in response to RV infection, whereas unique genes for SAEC were linked to sulfur compound catabolism.

Conclusions: Comparison of non-infected LAEC and SAEC identified regional hallmarks. RV infection of LAEC activated IL-1 signalling, key mediator of inflammation and fibrosis which might possess detrimental impact on the transplanted lung. Alteration of SAEC transcriptome signature during RV infection warrants further investigation. Collectively, this study provides starting points for the development of rational targeted therapeutic strategies.

89 Investigating the Effect of Chlorinated Drinking Water on the Infant Gut Microbiome

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Background and aim: The gut microbiome has been particularly interesting in recent years due to its links to health and disease. In infants, the gut microbiome is highly plastic, and

easily influenced by environmental factors. The development of a healthy gut microbiome is essential for a stable, diverse, and species-rich gut microbiome as an adult, and improper development of the gut microbiome in this sensitive period can lead to gut dysbiosis. Chlorine is one of the most effective ways to deliver safe drinkable water to the public free from microbial contamination because it produces a residual disinfectant that persists in the distribution system. Due to the antimicrobial effects of chlorine in tap water, this raises the question if persistent exposure to low-levels of chlorinated tap water may have a mild antibiotic effect to the diverse ecosystem of microorganisms that colonise the gastrointestinal tract. Thus, residual chlorine in tap water could be a potential unrecognised risk factor of gut dysbiosis.

Research method: We will use a randomised control trial study design to install water filters in participant's homes that remove residual chlorine from tap water. We will compare longitudinal changes in the infant gut microbiome from 6 months of age to 18 months of age via faecal samples between the intervention (unchlorinated water) and control (chlorinated water) groups.

Results: This project will investigate whether chlorine affects the natural spatial and temporal organisation of the gut microbiome in infancy and early childhood. We hypothesise that persistent exposure to low-levels of residual chlorine in early childhood may alter stereotypical colonisation of the infant gut microbiome, by reducing richness and diversity.

Conclusions: We will use metagenomics technology to identify novel links between the two groups and early childhood health outcomes, such as asthma and allergies.

90 Profile of acute rheumatic fever at Princess Margaret Hospital: 1987-2017

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Background: Acute rheumatic fever (ARF) and its sequelae rheumatic heart disease (RHD) present a significant health burden in Western Australia (WA), disproportionately affecting rural Aboriginal children. Clinical information regarding tertiary hospital admissions are lacking. Princess Margaret Hospital (PMH) represented the only paediatric tertiary hospital, thus enabling state-wide capture of ARF admissions. We aimed to describe the clinical profile of ARF from 1987-2017.

Methods: A retrospective review of medical records was performed on 240 ARF-coded (International Classification of Disease-10 I00-I09) admissions to PMH. Data was collated from medical records, Cardiobase and iSOFT.

Results: 166 episodes (85 Female, 81 Male; median age 10 years) in 145 individuals met the 2020 Australian guidelines; 32 episodes (19.3%) were recurrent and 126 (75.9%) involved RHD. The number of ARF episodes did not decrease over the study period. Nearly all (95.2%) episodes occurred in Aboriginal children, 63.9% of whom lived in rural areas. The most common major criteria were carditis (81.3%), joint symptoms (69.3%) and chorea (30.1%). 16/106 (15.1%) RHD patients required valvular surgery. Intramuscular penicillin was prescribed in 91% of episodes, however recording of adherence was poor.

Conclusion: The predominance of Aboriginal patients from rural areas reflects the burden of disease in remote Aboriginal communities which does not appear to have decreased over the 30-year period. The high prevalence of RHD and chorea reflects that tertiary admissions comprise higher acuity ARF cases. Our study highlights the continued need to address prevention strategies in high risk populations.

91 Measuring Strep A molecular density in school children living in the Kimberley.

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Background and aim: Children living in remote Australian communities bear a higher burden on *Streptococcus pyogenes* (*S. pyogenes;* Strep A) diseases than urban dwelling children. This includes complications such as acute rheumatic fever (ARF) which can develop from untreated, severe or recurring acute Strep A infections presenting as sore throat (strep throat; pharyngitis) and skin sores (impetigo). Accurate prevalence data is required to guide health strategies that aim to reduce the burden of Strep A infection; this is the focus of our school surveillance studies in the Kimberley region. Through-out 2019, the Missing Piece Surveillance Study (MPSS) resulted in the collection of hundreds of skin and throat samples which have been used to determine the prevalence of Strep A pharyngitis and impetigo with traditional culture-based methods. Molecular Strep A detection remains largely uninvestigated as a technique to understand Strep A prevalence and biology. We aim to further interrogate the skin and throat samples from this important cohort to determine the value of molecular Strep A detection.

Research method: Traditional microbiological culture has already been performed. In this study, we will perform optimized DNA extraction and *speB* (Strep A cysteine protease) quantitative PCR on 300 clinical skin and throat specimens to determine the Strep A concentration (pg/ul) and range. We will also evaluate correlations between concentration and symptomology (e.g. active pharyngitis vs carriage).

Conclusions: This honours project is still underway. We hope it will generate important data to enhance our understanding of Strep A colonisation.

93 Cognitive assessment of children and adolescents with acquired brain injury

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Background and aim: Evidence to guide the selection of valid, reliable, responsive and clinically useful cognitive assessments for children with acquired brain injuries (ABI) in acute hospital settings is currently limited. The current study aimed to explore the cognitive

assessments used within acute, subacute, rehabilitation and community settings with children and adolescents with ABI.

Research method: A scoping review methodology was used to summarise the evidence for clinical utility and psychometric properties of cognitive assessments for children with ABI aged 4 to 17 years old. This review was conducted in accordance with the methodology outlined by Arksey and O'Malley (2005) and included the following steps: (i) identifying the research aims and objectives; (ii) searching for applicable studies; (iii) methodically selecting studies; (iv) charting the data; (v) collating, summarising and reporting both the results and assessment of research quality; and (vi) consulting with stakeholders to disseminate the study findings.

Results: A total of 940 sources were screened by title and abstract, 68 were identified for full text review and 40 sources included in the final review. Of the 40 sources included in this study, only 7 reported on the specific clinical utility of the assessment. Of the remaining sources, very few thoroughly evaluated all psychometric properties.

Conclusions: Due to a lack of psychometric evidence and limited studies evaluating clinical utility, this review was unable to conclusively identify a suitable assessment for children and adolescents with ABI in an acute setting. Our findings highlight the lack of research surrounding clinical utility and evidence supporting measurement properties and the role this data plays in making evidence based decisions in the acute hospital context.

95 Screening for Cystic fibrosis related diabetes at Perth Children's Hospital

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Background and aim: There is considerable variation in recommendations from clinical practice guidelines on when and how to screen for glucose intolerance in Cystic fibrosis (CF). The Australian Standards of Care suggest oral glucose tolerance tests (OGTT) screening for adolescents with risk factors such as unexplained weight loss or growth failure. During 2019, 26% of patients with CF cared for at Perth Children's Hospital, who were 10 years or older had OGTT and 86% had HbA1C measurements.

Research method: A prospective cross-sectional study was performed on 88 patients in the CF clinic, older than 10 years, who are not prescribed insulin or prolonged oral/parenteral steroids. Patients who had not had an OGTT in 2020, were sent a letter in June with instructions on how to organise an OGTT. Results were followed up weekly.

Results: Prior to June, 10 patients had an OGTT. One had impaired glucose tolerance (IGT). By September, 34 OGTT were performed. One patient had a positive OGTT suggestive of CF related diabetes (CFRD) and six had results suggestive of IGT. The patient with results suggestive of CFRD, was reviewed by Endocrinology and subsequently determined to not have CFRD.

In terms of risk factors, the eight patients with abnormal results, four had suboptimal nutrition and one had undernutrition. None had changes in respiratory status or unexplained weight loss.

Conclusions: Patients with CF can have abnormal OGTT without obvious nutritional risk factors. The Australian Standards of Care may require revision.

Key words: Cystic fibrosis, diabetes

97 Significant associations of hepatic iron overload in transfusion dependent children

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Background and aim: Regular transfusion is a highly effective and well-established treatment in Paediatric Haematology. Consequent iron overload is a common complication and requires accurate assessment for mitigation of toxicity. Serum ferritin measurements are non-specific and liable to inflammatory and other changes, whilst liver biopsy is invasive, subject to significant sampling variability, and impractical for serial assessment. Non-invasive measurement of iron overload in children using a spin-density projection-assisted R2-MRI technique (FerriScan®) is a well-recognised method used to assess iron overload in these patients.

We aim to determine the significance of factors associated with high iron load quantified using FerriScan® including comparison of transfusion rates and use of iron chelator therapy.

Research method: A retrospective cohort study of the Western Australian paediatric transfusion dependant population was undertaken with liver iron content (LIC) established using FerriScan®. Disease related factors, age, total transfusion volume, iron chelation regimen, serum ferritin level, haemoglobin, and clinical markers were gathered between July 2019 and June 2020. χ^2 analysis to determine any association(s) was completed.

Results: Of 22 transfused patients, 16 underwent an LIC MRI measurement with disease and therapy related factors analysed for association. Factors associated with high iron load include serum ferritin, total quantity of packed RBC transfusion, and weekly dosage of iron chelation therapy, but not with other factors.

Conclusions: Optimal management in paediatric transfusion dependent anaemia requires careful consideration of patient factors, choice of transfusion regimen and optimisation of iron chelation therapy. Iron load can be robustly measured using liver MRI and this used to effectively guide best management.

99 The PATRIC (Pragmatic Adaptive Trial for Respiratory Infections in Children) Registry.

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Background and aim: Acute respiratory infections (ARIs) are a common condition presenting to paediatric emergency departments (ED), the leading cause of paediatric

hospitalisation in Western Australia and major driver for the excessive use of antibiotics in children.

The PATRIC Registry has been developed to evaluate the effectiveness of clinical care for ARI providing valuable baseline data to inform clinical guidelines and as a platform for clinical trials assessing antimicrobial interventions, immunomodulatory interventions, and supportive care interventions.

Research method: Any child presenting to Perth Children's Hospital (PCH) ED with fever and a acute respiratory infection (ARI) is eligible for participation in PATRIC. Using Parent Reported Outcomes and the medical record, the PATRIC Registry collects data on ARI diagnosis, treatment, clinical history, medication prescription and adherence, subsequent healthcare use, symptom resolution and parental anxiety

Results: The PATRIC Registry was launched in the PCH ED in February 2020. From Feb - April 2020, 99 participants were enrolled and 61% completed all surveys until recovery. Nearly 80% of the ARI children were <5 years. The mean recovery from ARI was 8 days (95% CI: 7–10) with 85% children returning to regular activities by 7 days. Of 61 subjects, 25 (41%) received antibiotics.

Conclusions: The PATRIC electronic data collection tools can allow assessment of current treatment practice and surveillance of seasonal ARI severity in real-time. Baseline data shows that the majority of children with outpatient diagnosed ARI recover within a week. The PATRIC Registry provides a platform to for embedding clinical trials on ARI at PCH.

100 Food insecurity and type 2 diabetes in children: A systematic literature review.

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Background and aim: The incidence of children and adolescents being diagnosed with type 2 diabetes (T2D) in Western Australia is increasing, with approximately three in five of these children from Aboriginal or Torres Strait Islander descent. The ability to afford, access and acquire nutritionally adequate and culturally appropriate foods could play a role in the risk of developing T2D. Internationally, studies have looked at the association between T2D and food insecurity, yet no systematic review of the literature has been conducted. This systematic literature review aims to determine the relationship between food insecurity and T2D in children and adolescents, including Indigenous and culturally and linguistically diverse groups.

Research method: PubMed, MEDLINE (Ovid), CINAHL and Cochrane Library databases will be searched to identify studies for inclusion. The search will be restricted by publication date of 1990 – present, English language and human studies. Children and adolescents aged 1-18 years that are diagnosed with either impaired glucose tolerance or T2D and experience food insecurity, will be included in this systematic literature review. The selection of studies, assessing the risk of bias within the selected studies and data extraction, will be completed by two reviewers.

Results: The review is being conducted in September/October 2020 with the review finalised in November 2020.

Conclusions: The findings of this systematic literature review will help guide future research within the Children's Diabetes Centre at Perth Children's Hospital and Telethon Kids Institute, a collaborative, integrated clinical research centre.

102 Yawardani Jan-ga (Horses Helping): An experiential learning approach with Aboriginal Young People

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Equine Assisted Learning (EAL) is an experiential learning approach that simultaneously engages sensory, neuromotor and cognitive systems to promote wellbeing outcomes. EAL is very different to office-based social and emotional wellbeing interventions and seems particularly suited to support the wellbeing of Aboriginal young people due to their flexibility, their non-confrontational non-verbal methods for feedback, and importantly, the historical ties to horses through working and living on country.

The Yawardani Jan-ga (Horses doing Healing) EAL intervention responds to the urgent needs of Aboriginal young people across the Kimberley. This study aims to evaluate the impact of the EAL intervention on the social and emotional wellbeing of Aboriginal young people.

The study will employ a non-experimental study design and use research methods that privilege the voices and experiences of Aboriginal children, families and communities including participant observation during EAL sessions, yarning with participants and parent/carers, and interviews with school teachers. These methods will capture (a) equine communication as a mechanism for participant awareness and emotion regulation, (b) the development of communication, emotion regulation, and prosocial skills, and (c) transference of these skills competencies across relational contexts (e.g. home and school environments) across three follow-up periods: one immediately after the intervention, six and 12 months after the completion of the intervention.

This project has the potential to answer fundamental questions about what type of services and programs can achieve significant positive changes among , and how these interventions can be centred around family, community, culture and country.

Key words: Cultural security, Aboriginal Social and Emotional Wellbeing, Equine Assisted Learning, Evaluation science.

103 Experiences learned from individuals managing Type 1 diabetes using closed loop systems

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Aim: Hybrid Closed Loop (HCL) improves glycaemic outcomes in individuals with Type 1 diabetes (T1D) however there is lack of knowledge regarding their experience in using the

system. We explored the real-world, experiences of youth using HCL and their parents, to provide insight into their lived experiences.

Methods: Children and adolescents 12 – 25 years and their parents participated in an interview following a six month randomised clinical trial of HCL. Open-ended questions were used to explore the lived experiences of families. The interviews were analysed and coded using thematic analysis.

Results: Seventeen young people with T1D (Mean age: 17.5±4.2yrs, diabetes duration: 11.0±4.9yrs and-HbA1c 8.0± 0.8%) and 10 parents were included. They reported a positive experience using the HCL system, with improvements diabetes management. Four main themes were identified:

1. 'Ownership of diabetes management', through increased independence with diabetes and less parental responsibility
2. 'Impact on anxiety' with reduced anxiety related to nocturnal and post exercise hypoglycaemia 'Confidence and trust in the system', related to accuracy and ease of use 'Issues with device/algorithm', related to the conservative approach to correction for hyperglycaemia, the size of study devices, and the number and sound of alarms

Conclusion: Young people and parents acknowledged the benefits of the HCL system in improving glycaemic outcomes as well as in providing flexibility and independence. Lived experiences of individuals using the system provide valuable information on the use of newer interventions in clinical settings.

Key words: Type 1 diabetes; Hybrid closed loop; learned experiences

104 A four-phase Paediatric Nursing Research Priority Setting Study

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Background and aim: Priority setting for paediatric nursing is important to plan, coordinate and direct future research. This project will explore and identify a top 10 list of paediatric nursing research priorities from the perspectives of consumers, community, and health professionals in WA.

Research method: A prospective adapted James Lind Alliance methodology with four phases 1) a scoping review of paediatric nursing research priorities. Four databases were searched for English language full-text publications from 2008 to 2019. A total of 44 articles were retrieved and assessed for eligibility. 2) A planning workshop was held with consumers and multidisciplinary health professionals. 3) A survey using open-ended questions was distributed to consumers and health professionals through organisational email lists and social media. We anticipate 400 responses will be thematically analysed. 4) A consensus workshop will identify the top 10 priorities for 2021 and forward.

Results from phase 1: Eight studies with quality scores (CREDES) ranged 10–14 out of 16 were included in the review. Synthesis of 234 nursing research priorities generated four themes; evidenced-based practice, paediatric context, child and family-centred care, and

paediatric nursing, with 14 subthemes. Consumer and community health priorities had not been reported.

Conclusions: The nursing research priorities identified in the review represent the perspective of nurses and focus on acute care, with fewer priorities reflecting areas of child-, school-, or mental-health. Establishing priorities from the perspective of all stakeholders and identify what is important to consumers in WA will be addressed in phase 3 and 4.

105 Detecting *Streptococcus pyogenes* from Environmental Swabs in a Remote School in Western Australia

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Background and aim: *Streptococcus pyogenes* (Strep A) is responsible for a wide range of invasive, non-invasive and autoimmune diseases. Strep A is largely thought to be spread through direct contact or droplets, however the role of the environment in Strep A transmission is unknown. The aim of this study was to determine if Strep A could be detected from high touch surfaces in a remote school setting.

Research method: Environmental swabs were obtained from high touch surfaces in a primary school located in the Kimberley region of Western Australia. The objects included playground equipment, sporting equipment, door handles, computer keyboards, and light switches. All the swabs were stored in skim milk glycerol broth and transported to Perth for laboratory evaluation. We cultured the swabs using horse blood agar and agar supplemented with colistin nalidixic acid to detect beta-haemolytic colonies. Quantitative polymerase chain reaction (qPCR) assays were also performed to confirm culture findings.

Results: Of the eighteen environmental swabs obtained, we were unable to detect Strep A using both culture and qPCR methods. Other organisms, however, were cultured from all but two swabs, which were obtained from a door handle and a light switch.

Conclusion: Although Strep A was not detected, the microbial growth observed in this study highlights the importance of good hygiene practices in the school setting to minimise the likelihood of environmental transmission. We acknowledge our sample size is a limitation thus a larger environmental swabbing study using robust methods is needed to further explore transmission of Strep A in the environment.

Keywords: School, Pathogen, Transmission, *Streptococcus pyogenes*

106 Neurofeedback - New Directions in the Treatment of Developmental Trauma

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Background and aim: Neurofeedback (EEG biofeedback) although not a new technology, has more recently been applied to children who have experienced developmental trauma with promising results. It has been well documented how children's brains are severely compromised by chronic abuse and/or neglect (developmental trauma). One type of neurofeedback treatment (NFT) called Slow Cortical Potential (SCP) has been extensively

applied to the treatment of ADHD in children. It has been well documented that this form of treatment is efficacious in reducing symptoms of impulsivity and inattention. There exists a significant overlap of symptomatology between ADHD and children who have experienced developmental trauma, specifically in the areas of self-regulation, information processing and executive functioning difficulties. Our aim is to determine the clinical utility of applying Slow Cortical NFT with children who have experienced developmental trauma. The current study represents a “proof of concept” pilot for the use of Slow Cortical NFT with children who have experienced developmental trauma.

Research method: The children will be assessed to determine their suitability to participate in the feasibility study. Children will need to be safe and stabilised with their carers, and currently engaged in the overall treatment program offered by CPU therapy team . Children will be offered 40 sessions twice weekly over the course of 6 months.

Results: Study has not commenced thus results are not available.

Conclusion: Children with developmental trauma often do not respond to traditional therapy approaches, this study represents a need for exploring alternative approaches which take into account the brain injury caused by neglect and/or abuse.

108 OUTCOMES OF NEONATES WITH CONGENITAL DUODENAL OBSTRUCTION: A RETROSPECTIVE STUDY

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Background and aim: Congenital duodenal obstruction (CDO) is a common cause for congenital intestinal obstruction. We did not have data on the outcomes of CDO from our institution. Aims: a. to describe the outcomes of neonates with CDO, b. to compare between old epoch (2002-2011; n=37) and new epoch (2012-2019; n=39); c. to evaluate the association between time to commence enteral feeds and time to reach full feeds.

Research method: Retrospective study

Results: A total of 76 infants were included. The median gestational age was 37.2w (range: 25.7 to 40.8). More than half had some type of associated anomalies. There were four deaths, none of which were preventable. The mean Z scores at discharge was lower for weight at ($p<0.0001$) and head circumference ($p=0.021$) but adequate catch up growth occurred by one year. The median General quotient (GQ) at 1 year among 41 non-syndromic infants was 100. Infants in the new epoch had shorter duration of antibiotics, longer duration of general anaesthesia per procedure and longer duration of post-operative ventilation, and higher GQ scores than the old epoch. On multivariable gamma regression analysis with log transformation, each day delay in commencing enteral feeds was associated with a 6% increase in the time to reach full enteral feeds.

109 Osteoarticular infections in hospitalised children: outcomes and predictors of complicated disease

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Background and aim: Osteoarticular infections are common in childhood. Most resolve without acute complication, but long term outcomes are poorly reported, especially in settings where *Methicillin-resistant Staphylococcus aureus* (MRSA) is prevalent. To inform the need for risk-stratified management, we aimed to characterise the epidemiology of disease and identify risk factors for complicated disease.

Research method: We prospectively enrolled hospitalised children (0-17 years) with osteoarticular infections over 48 months (2016-2018) at the tertiary referral hospital in Western Australia. Demographic, clinical, laboratory, radiological and treatment data were collected. Outcomes were assessed at 12-months using a standardised instrument. The following criteria were used to define complicated cases (i) bacteraemia ≥72 hours, (ii) *any* surgical debridement for osteomyelitis or ≥2 debridements for isolated septic arthritis, (iii) progression or recurrence of disease, (iv) prolongation of therapy or (v) chronic sequelae. Logistic regression analysis was performed to identify factors associated with complicated disease.

Results: 202 children were identified; 192 consented for inclusion (95%). One-hundred cases (52%) were culture/polymerase chain reaction positive for a bacterial pathogen; of which 58% were positive for *S. aureus* (15% were MRSA). The second most commonly identified pathogen was *K. kingae* (16%). Follow-up was possible for 139 children (72%); 118 (85%) reported complete recovery. The most important predictor of complicated disease was *S. aureus* (OR 14.1, 95% CI 3.4-57.9). All *K. kingae* cases were categorised as uncomplicated, and all polymicrobial infections were complicated.

Conclusions: In our setting, identification of S. aureus is associated with complicated disease. Risk prediction tools require further development and clinical validation.

110 Novel Therapies for Diffuse Intrinsic Pontine Glioma (DIPG)

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South Wales, Sydney, NSW, Australia, 6 Kid's Cancer Centre, Sydney Children's Hospital, Randwick, NSW, Australia

Background and aim: DIPG is a very aggressive paediatric brain cancer with no known curative therapy. The overarching aim of this project was to identify novel therapies which can be translated from the bench to the bedside. The specific aims were:

Research method: In vitro and in vivo experiments looking at activity of fenretinide and other agents in combination against DIPG cell lines and mouse models. Experiments included cellular proliferation assays, apoptosis assays, and investigating molecular biology.

Results: Fenretinide showed good activity in DIPG cell lines which was confirmed in mouse models. There were also some promising combinations identified.

Conclusions: Fenretinide represents a novel potential treatment option which needs further investigation. Also, we identified a previously unknown mechanism of action of fenretinide.

111 Early life respiratory infections perturb lung function in adulthood

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Background and aim: Environmental exposures in early-life can alter developmental trajectories and induce long-term changes in physiological function. To address this issue, we developed a mouse model of respiratory viral infection, in which infected neonates have impaired lung function as adults. The aim of this study is to identify virus-induced perturbations to pulmonary gene networks that are linked to developmental and physiological changes.

Research method: BALB/c pups were inoculated with Influenza A/Mem/1/71, Influenza A/PR/1/8 or relevant control at seven days of life. Pups were sacrificed and lung tissue was collected for every treatment group at day 7, 14 and 28 post-infection for RNA-seq analysis. Remaining pups grew to adulthood, when lung function and responsiveness to methacholine (MCh) were assessed.

Results: Prior infection with either Influenza A/PR/1/8 or A/Mem/1/71 resulted in male mice being significantly more responsive to MCh as adults with respect to airway resistance, compared with uninfected controls. Cluster analysis of RNA-Seq profiles demonstrated that PR8 strongly perturbs pulmonary gene expression patterns at seven days' post-infection, and whilst these changes wane over time, they persist out to day 28 post-infection. Mem71 infection produced a milder perturbation of pulmonary gene expression in comparison to PR8.

Conclusions: We showed that neonatal respiratory viral infection can impact on lung development and ensuing physiological function in adulthood, and this was reflected in the patterns of the underlying gene networks. Our experimental mouse model can be leveraged to understand the molecular mechanisms and principles that link early-life exposures with phenotypic development.

112 The BRiCK study: analysis of the Burden and Response in Cellulitis in Kids.

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Background and aim: Cellulitis is common in childhood, yet few studies describe the burden and response to treatment. We aimed to characterise the epidemiology, clinical features, and treatment of children with cellulitis in Australia.

Research method: We performed a retrospective study of children with cellulitis presenting to Perth Children's Hospital and Albany Healthy Campus. Approval was through GEKO.

Results: 431 episodes of cellulitis were included: 299/395 (75.7%) admissions, 96/395 (24.3%) non-admitted tertiary emergency presentations and 36/36 (100%) regional presentations. The median age was 5 years (IQR 3-9 years), 62 (14.4%) were Aboriginal and 255 (59.2%) male. The face was the most commonly affected body site amongst admitted patients (49.8%), with dental infection the leading cause (31.1%). This was significantly different from non-admitted patients, where the extremities were most affected (63/132, 47.7%), p<0.00001). The most frequent microbiological investigation was wound swab (143/431, 33.1%), which yielded positive cultures in 81.8% (117/143). The most frequent organisms identified by wound swab were *Staphylococcus aureus* (99/117, 84.6%) (methicillin susceptible *S. aureus* (n=62/99, 62.6%), methicillin resistant *S. aureus* (n=37/99, 37.4%)) and *Streptococcus pyogenes* (n=24/117, 20.5%). Intravenous (IV) flucloxacillin was the preferred antibiotic (156/239, 65.3%). For inpatients, the median duration of antibiotics was: IV 2 days (IQR = 2-3), oral 5 days (IQR = 5-7) and total 8 days (IQR = 6-9). In cellulitis of odontogenic origin, metronidazole and benzylpenicillin were used most frequently (24/40, 60.0%).

Conclusions: Cellulitis in WA disproportionately affects Aboriginal children and those below five. Cellulitis falls into three groups: facial cellulitis associated with dental infections, periorbital cellulitis and cellulitis of the extremities, with different therapeutic management. This study furthers our knowledge of the breadth of paediatric cellulitis and prevention activities.

114 Expecting a baby in a digital era: Device use and prenatal attachment

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Background and aim: Prenatal attachment (the relationship between a parent and their baby during pregnancy) is of great importance, as evidence suggests it leads to secure attachment in early childhood and to better child developmental outcomes in the future. Many potential influences on prenatal attachment have previously been explored. However, one possible influence on prenatal attachment yet to be considered is the use of mobile touch screen devices such as smartphones and tablet computers. The advancement of screen technology in recent years has led to devices having a pervasive impact on expecting

parents' lives during their transition to parenthood. This study aimed to investigate how the use of mobile touch screen devices influences parents' thoughts, feelings and behaviours towards their baby during pregnancy.

Research method: Interviews were conducted with 27 expectant parents/parents of newborns. Participants were recruited from the larger pool of participants in the ORIGINS Project.

Results: All families described using devices for a variety of purposes, and all described secure prenatal attachment. Many parents indicated they had not previously considered the influence of device use on their relationship with their baby. On reflection, a quarter overall described negative influences and half described positive influences.

Conclusions: The findings highlight a new opportunity for how health professionals and guidelines can educate families to maximise benefits and reduce downsides of mobile touch screen device use in order to optimise prenatal attachment, and thus future parent-child attachment and child development.

116 Western Australia Atropine for the Treatment of Myopia (WA-ATOM) study

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Background and aim: The Western Australia Atropine for the Treatment of Myopia (WA-ATOM) study aims to determine the efficacy and long-term effects of low-dose atropine eyedrops in myopia control. This we report the study rationale, methodology and participant baseline characteristics.

Research method: Single-centre, double-masked, randomized controlled trial involving WA children (6-16 years) with spherical equivalent ≤−1.50 D in each eye, astigmatism ≤1.50 D and myopia progression by ≥0.50 D/year. Enrolled children were randomly assigned 2:1 to receive 0.01% atropine or placebo eyedrops. Participants are examined every 6 months during first 3 years of the study (2-year treatment phase followed by a 1-year washout phase), and then at a 5-year follow-up (2 years after the end of the washout phase). Main

outcome measures were annual progression rate of myopia and axial length, tolerability to eyedrops and incidence and severity of unwanted effects.

Results: There 242 of 341 children suitable for study participation, and 153 were subsequently enrolled. The baseline characteristics of enrolled participants are presented.

Conclusions: Outcomes of the WA-ATOM study will inform on the efficacy, tolerability, safety and long-term effects of low-dose atropine eyedrops in myopia control in Australian children. The impact of ocular sun exposure, iris colour and parental myopia on the efficacy of low-dose atropine will also be assessed.

117 Early lung ultrasound as a predictor of Bronchopulmonary Dysplasia

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Objective: To test the hypothesis that lung ultrasound (LUS) performed in the first week of life would predict bronchopulmonary dysplasia (BPD). Secondary outcomes included the utility of LUS in predicting interim respiratory interventions.

Design: A prospective observational cohort study in preterm infants born < 28 weeks' gestation in the single tertiary statewide NICU in Western Australia.

Methods: We successfully implemented clinician performed LUS utilising a standardised approach and published a unique interactive audio-visual training module (Australasian Society of Ultrasound Medicine). We executed a rigorous protocol for LUS acquisition on day 1, day 3 to 4, day 7, day 28 and 36 weeks' postmenstrual age (PMA), with blinded analysis using a modified, previously validated LUS score. BPD was defined by both recent NIH categorical criteria and a continuous physiological variable using a modified shift test.

Results: Primary outcome data was available for 96 of the 100 infants studied, surviving to 36 weeks' PMA. In a univariate analysis LUS on days 3 to 4 and day 7 accurately predicted BPD. The predictive value was lost in a multivariate model in which gestational age was the dominant predictor. LUS accurately predicted short term respiratory outcomes including surfactant administration, duration of intubation and extubation at 48 hours.

Conclusions: LUS in the first week of life predicted the severity of BPD, however offered little additive accuracy to gestational age. Furthermore, we have set a robust standard for training, implementation and utility of LUS for respiratory care and further research within neonatal intensive care.

118 Psychosocial functioning of obese children, adolescents and parents participating in the Healthy Weight Service

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Background and aim: The Healthy Weight Service (HWS) is a multi-disciplinary family focused lifestyle change program providing behavioural change intervention and education for children and adolescents with significant obesity. The aims of this study were to examine:

- changes in health-related quality of life (HRQOL) for children and adolescents
- changes in levels of parental stress
- associations between HRQOL, parental stress and changes in weight

Research method: An observational study of 78 children, adolescents and parents/carers who attended the HWS between 2016 and 2019. Measurements were taken at baseline, 6 and 12 months. Measures included The Paediatric Quality of Life Scale (PedsQL), Kessler 10 (parental stress measure), weight and height.

Results: PedsQL measures indicate that HRQOL improved at 6 months but this improvement was not completely sustained at 12 months. Parental stress scores fell largely in the low to medium range and did not significantly change. The relationship between these scores and changes in child and parent weight will be explored.

Conclusion: More research is required to explore how changes in HRQOL can be sustained over time.

Key words: paediatric obesity, psychosocial functioning, behaviour change

119 Review of Congenital Heart Disease (CHD) coding practices in WA

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Background: Inaccurate classification of CHD can result in inaccurate incidence and prevalence data provided to the birth registry with a significant impact on the accuracy of research data and subsequent results. Standardization of global CHD nomenclature would improve quality and global impact of CHD research.

Aims: To assess the validity and accuracy of our department coding practice and ensure they are reflective of true CHD data. To develop recommendations to improve coding efficacy & practice & hence reduce false positives & false negatives in data base.

Methods: All first time unlimited reported transthoracic studies performed in our department over 2 years (3rd of January 2017 and 31st of December 2018) were included. All reported studies were coded blindly based on collected data using EPCC coding. Following initial analysis, all studies where then assessed for their initial coding.

Results: 25% of studies were not coded. Of the non-coded studies, 10.6% had minor CHD, 3.7% had major CHD and 2% had other abnormalities. 48% were performed by doctors vs 23% performed by echo technicians. 24% performed in the Echo lab were not coded, 27% performed in the wards were not coded and 18% performed in outreach clinics were not coded. 12% of coded studies had coding discrepancies, 1% of which major. 60% of the minor discrepancies were coding for PFO & PDA in neonates.

Conclusion: Audit highlights significant individual variations in coding practices, with 1 in 4 first time studies not coded. Standardised coding practices are vital for accurate CHD data capture.

120 Epidemiological description of the first 600 confirmed COVID-19 cases in Western Australia

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Background: COVID-19 was declared a pandemic by the World Health Organization on 11 March 2020. We describe the first 600 confirmed cases notified in Western Australia (WA).

Methods: Laboratory-confirmed COVID-19 is notifiable in WA. Data from the first 600 confirmed COVID-19 cases were extracted from the Western Australian Notifiable Infectious Diseases Database and the Department's COVID-19 contact tracing database. Data were analysed using MS-Excel, STATA and R. We conducted a descriptive analysis of cases, close contacts and associated outbreaks in WA from February-July 2020.

Results: The first 550 cases were reported between 24 February and 16 April 2020, (peak, 20 March), and the last 50 cases were reported by 1 July 2020. Most infections were acquired overseas or at sea (n=513, 86%) followed by locally acquired (n=65, 11%); n=22, 3% had an unknown source. The incidence was highest among 70-79-year-old patients (55.6 per 100,000); 56% were male. By region, the Kimberley had the highest incidence (41.9 per 100,000) followed by the Metropolitan region which includes overseas returned travellers (16.9 per 100,000). A total of 24 COVID-19 outbreaks were investigated. The mean number of close contacts per case was 1.9 for household and 8.1 for non-household contacts. The most common outbreak setting was cruise ships which accounted for 77% of cases (n=230), 91% of hospitalisations (n=75), and 89% of associated deaths (n=8) in WA.

Conclusions: To date, there has been limited transmission of SARS-CoV-2 in WA. This may be a result of a combination of public health measures which include travel bans, mandatory hotel quarantine, social distancing, contact tracing, as well as the unique geographical remoteness of WA.

121 Paediatric Headbox as Potential Aerosol and Droplet Barrier

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Background: High nasal flow oxygen (HFNO) administration is often performed in hospitals and results in the production of droplets (>5µm) and aerosols (<5µm) that could potentially transmit SARS-CoV-2 and place health workers at risk.

Aim: To determine if placement of a headbox could reduce droplet and aerosol transmission in patients on HFNO.

Methods: Size and dispersion of propylene glycol (as a model for infectious patient derived aerosol/droplets) was measured using an optical particle spectrometer with an infant mannequin receiving 10-50 litres/minute(LPM) of HFNO using (1) an open headbox, (2) headbox with blanket or (3) headbox with N95-equivalent filter covering the neck opening and (4) no headbox. The effect of cough on aerosol dispersion was simulated using validated computational fluid dynamic models.

Results: The open headbox system reduced the dispersal of droplet particles. The headbox-blanket system reduced droplet but increased aerosol dispersal. The headbox-filter system reduced both droplet and aerosol dispersion.

The fraction of aerosols escaping the headbox for each set-up was as follows for HFNO of 10 and 50LPM respectively: (1) open headbox: 0.416 and 0.486; (2) Headbox-blanket: 0.159 and 0.263; (3) headbox-filter system: 0.015 and 0.06. Simulated cough did not influence aerosol/droplet emission from the headbox.

Conclusions: A modified paediatric headbox with a filter attachment may serve as an effective droplet/aerosol barrier for the protection of staff caring for children requiring HFNO. This concept could be applied to other aerosol generating procedures, as a cost-effective means of reducing infectious disease transmission in the context of the current global pandemic.

122 Postnatal weight-gain based algorithm (WINROP) to predict severe retinopathy of prematurity: A Systematic Review and Meta-Analysis

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Background: Screening for retinopathy of prematurity (ROP) requires frequent close eye examinations, entailing a heavy clinical workload. Frequent eye examinations that require close physical contact between the infant and healthcare professionals can potentially increase the risk of COVID-19 transmission. The weight-gain based algorithm (WINROP) developed by Swedish researchers has the potential to predict severe ROP and reduce the need for frequent close ophthalmic examinations. Many studies have evaluated the utility of WINROP, but there are no systematic reviews.

Methods: A systematic review (32 studies) was conducted to evaluate the accuracy of WINROP algorithm to predict severe ROP. Meta-Analysis was conducted using Stata 16.0. Pooled sensitivity, specificity, summary area under the ROC curves, likelihood and diagnostic odds ratios were calculated. Fagan plots were used to generate posterior probabilities of a positive test for various baseline prevalence rates. Risk of bias was assessed using the QUADAS-2 tool.

Results: The pooled estimates for sensitivity and specificity were 0.89 (95%CI 0.82-0.93) and 0.57 (95%CI 0.50-0.64) respectively. The summary area under the ROC was 0.80 (95%CI 0.76-0.83) and the pooled odds ratio value was 10.71 (95%CI 5.97-19.21). The

positive and negative likelihood ratios were 2.08 (95%CI 1.76-2.45) and 0.19 (95%CI 0.12-0.31) respectively. Majority of studies had low risk of bias.

Conclusions: WINROP algorithm has good ability to predict severe ROP. A normal WINROP algorithm helps in ruling out severe ROP with reasonable certainty. WINROP is useful to reduce the number of eye examinations, without compromising the safety of preterm infants, especially during the coronavirus pandemic.

123 Utility of Ages and Stages Questionnaire in predicting suboptimal neurodevelopmental outcomes in high-risk late preterm and term infants: A Retrospective study

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Background and aim: During the COVID-19 pandemic, our unit faced challenges following-up high-risk infants for one year developmental assessments using Griffiths Mental Developmental Scales (GMDS-III). The ASQ-3 is used as part of our neonatal follow-up program, but the reported results in published literature are heterogeneous. The aim of this study was to determine the ability of ASQ-3 as a screening tool to identify Suboptimal Neurodevelopmental Outcomes (SNDO) at 12months in high risk late preterm and term infants (our NICU graduates). SNDO was defined as GQ<85 on GMDS-III or cerebral palsy or sensorineural deafness or blindness.

Research method: This was a retrospective study. Corresponding 12month ASQ-3 and GMDS-III scores were examined in eligible infants. The sensitivity, specificity, positive predictive value, negative predictive value, area under the ROC curves and likelihood ratios were calculated.

Results: A total of 134 patients were included in the analysis. Seven were diagnosed as having SNDO. The primary outcome of failure in ASQ domain versus SNDO found 100% sensitivity and 100% Negative Predictive Value. All seven infants with SNDO were identified using the ASQ. However, false positive rates were high because 72 infants who did not have SNDO had some concerns on ASQ report.

Conclusions: The high NPV and sensitivity results demonstrate that the ASQ-3 is a useful screening tool. During the COVID-19 pandemic, a totally normal ASQ report could be considered as reassuring where assessment with GMDS-III is not possible. High false positive rates are less concerning given that such infants will be reviewed using formal assessments.

124 Clinical Staff Knowledge Survey on the Long-Term Outcomes of Very Preterm Infants

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Aim: We aimed to assess the knowledge of clinical staff in our tertiary neonatal intensive care unit (NICU) regarding neurodevelopmental outcomes of preterm infants using the Premature Birth Knowledge Scale (PB-KS).

Methods: An anonymous convenience sampling survey of clinical staff in the NICU at King Edward Memorial Hospital (KEMH) was conducted between July-December 2019. Data collection included the PB-KS, demographic information and prior staff education on long-term outcomes.

Results: There were 56 responses (five neonatologists, eight paediatric trainees, 41 neonatal nurses and two allied health staff). The mean score on the PB-KS was 19.5 (range: 4 to 29 out of 40) with mean accuracy of 50%. Correct answers were highest (96%) for rates of cerebral palsy and lowest (11%) for estimation of quality of life among preterm survivors. Inadequate training about long term outcomes was reported by 55.36%, 20% reported attending relevant teaching (conference/ seminar) and 41.07% reported having both (formal training +seminars). Clinical staff perceptions of being adequately trained about long-term outcomes were not reflected by more correct answers however being formally trained was associated with higher scores. Didactic seminars were indicated as preferred choice for staff education.

Conclusions: Results of our survey will assist in developing a customized educational program to address identified gaps in the knowledge of clinical staff. Furthermore, staff responses indicated that clinical knowledge on long-term outcomes was variable; with accuracy being higher while discussing severe disabilities (cerebral palsy) but lower around estimating overall quality of life in VPT children.

Key Words: longer term outcomes, neurodevelopment, preterm infant*;*

125 Outcomes of Very Preterm Infants with Neonatal Hyperglycaemia: A Systematic Review and Meta-Analysis

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Background and aim: Neonatal hyperglycaemia is a common finding in very preterm and very low birth weight (VLBW) infants. We conducted a systematic review to explore the association between hyperglycaemia and adverse clinical outcomes in very preterm or VLBW infants.

Research method: PubMed, EMBASE, EMCARE, MEDLINE, Cochrane Library, ClinicalTrials.gov, Opengrey and Mednar were searched to August 20, 2020. Data from the included studies were pooled separately for adjusted and unadjusted odds ratios (ORs) using random effects model of meta-analysis.

Results: Forty-six observational studies with data from 34,527 preterm infants (<32 weeks) were included. Meta-analysis of unadjusted ORs found hyperglycaemia to be significantly associated with mortality, any grade intraventricular haemorrhage (IVH), severe IVH, any grade retinopathy of prematurity (ROP), severe ROP, sepsis, chronic lung disease (CLD)

and disability. However, pooled adjusted ORs (aOR) found significant associations only for mortality [aOR (95% confidence interval (CI)): 2.41 (1.39-4.17); I^2: 57%;12 studies] and any grade IVH [aOR (95% CI): 2.20 (1.12-4.32); I^2:0%; 3 studies]. The pooled aOR for mortality and unspecified IVH continued to remain statistically significant on sensitivity analysis. Very few studies had reported aOR for other outcomes. Meta regression analysis found higher glucose levels to be associated with increased risk of unadjusted mortality, but not other adverse outcomes.

Conclusions: Neonatal hyperglycaemia is associated with higher risk of mortality and any grade IVH in very preterm infants. A limitation was high statistical heterogeneity for majority of the outcome measures. Randomised trials evaluating the efficacy and safety of strategies for managing hyperglycaemia are urgently needed.
This review was registered with PROSPERO, CRD42020193016.

Key words- Low birth weight infant, very low birth weight infant, hyperglycaemia

126 Faecal microbiota composition in extremely preterm infants supplemented with single or triple-strain Bifidobacteria (SiMPro study)

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Background and Aim: Necrotizing enterocolitis is preceded by dysbiosis and probiotic supplementation is an effective preventive intervention. Evidence suggests that multi-strain probiotics may be more beneficial than single-strain. We aimed to assess the faecal microbiota composition in extremely preterm neonates (EP: Gestation/ GA <28 weeks) receiving single vs. three-strain probiotics (SiMPro study).

Methods: EP neonates (N=173) were randomly allocated to a three-strain (n=87; B. *breve* M-16V, B. *longum subsp. infantis* M-63, B. *longum subsp. longum* BB536: total: 3×10^9 CFU/day) or single-strain (n=86; B. *breve* M-16V; 3×10^9 CFU/day) probiotic while assuring blinding. EP infants in placebo arm of our previous probiotic trial were controls. Secondary outcomes included fecal microbiota diversity and composition across samples collected before (T1) and three weeks after supplementation (T2) using 16s ribosomal RNA gene sequencing. Some samples (n=160) were subjected to next generation sequencing.

Results: At T2, bacterial richness and α-diversity remained comparable; but β-diversity was significantly different (p=0.001) between probiotic and placebo groups. Community structures were significantly different between the probiotic treated groups (p=0.001). Probiotic groups showed significantly higher Actinobacteria and Fusobacteria (p<0.05); lower Proteobacteria and Firmicutes (p>0.05) and significantly low Gammaproteobacteria

(p<0.01) compared to placebo. Single and three-strain probiotic groups were significantly enriched by B. *breve* and B. *longum,* respectively.

Conclusion: EP infants supplemented with single or three-strain Bifidobacteria showed Bifidobacteria dominance and lower Gammaproteobacteria compared to placebo. Although microbial profiles were comparable between single and three-strain groups at phyla level (p>0.05), significant differences in taxa were noted at Family, Genus and Species levels.

127 Comparison of Visco-elastometry tests to Standard coagulation tests in neonates ≥35 weeks GA (Gestational age) admitted in neonatal Intensive care unit (NICU)

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Background and aim: Neonatal haemostasis is GA dependant development process. Standard coagulation tests in neonates often show increased values for Prothrombin time (PT), activated Partial Thromboplastin Time (aPTT) and International Normalised Ratio (INR) compared to adults. This results in clinical dilemma about optimum cut off levels to decide on blood product administration. Visco elastic tests [Rotational Thromboelastogram (ROTEM)] assess haemostasis in more detail. We aim to compare ROTEM with Standard Coagulation profile in neonates ≥35 weeks GA admitted in NICU.

Research method: This is a Diagnostic accuracy study. Eligible parents will be approached for consent. ROTEM test will be conducted whenever the treating clinician decides to perform the standard coagulation tests. Additional Whole blood volume of 0.35 microlitre will be required for ROTEM along with 1 ml for standard coagulation test. It will be collected & dispatched as per CLSI (Clinical and laboratory standard institute) guidelines. Treating clinician will be blinded to ROTEM results and treatment decisions will be based on Standard coagulation test. We plan to include 100 patients. Statistical analyses will be done at the end of study. STARD guidelines will be used to report the study.

Results: Study results will be presented in concise description with tables and figures as needed.

Conclusions: (not applicable) as this is a study proposal.

128 Excess mortality and brain injury in outborn preterm infants in Western Australia

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Background and aim: Preterm babies born outside tertiary neonatal units have increased risk of death and disability compared to those born within them. Western Australia (WA) has the largest neonatal retrieval area in the world. We compared mortality and adverse neuroimaging findings of outborn preterm babies (outborns) to infants inborn <32 weeks in WA.

Research method: A cohort study was conducted of all babies <32 weeks' born in WA between 1st January 2005 and 31st December 2018. Inpatient data (King Edward Memorial, Perth Children's and Princess Margaret Hospitals) were acquired from hospital databases; outborn data from statewide midwifery notification system (died before admission). Survival to discharge and cranial imaging findings (interventricular haemorrhage (IVH) ≥grade III, periventricular leukomalacia (PVL) and these combined) were compared between outborns and inborns using multivariable logistic regression analysis, controlling for gestational age, birthweight z-score, sex and multiple birth.

Results: Data from 4595 <32 week liveborn infants were analysed (443 outborn (9.6%), 4152 inborn). 56/443 (12.5%) outborns died before admission. Outborns were less likely to receive antenatal corticosteroids (48.4% vs 96.1%, p<0.001). Death before discharge was more common in outborns (20.5% vs 5.5%, p<0.001). Outborns had higher rates of IVH (8.1% vs 5.0%, adjusted odds ratio (aOR) 1.8, 95%CI 1.2-2.8, p=0.005), PVL (3.1% vs 1.5%%, aOR 2.0, 95%CI 1.1-3.8, p=0.032), and combined (10.7% vs 6.0%, aOR 1.98, 95%CI 1.37-2.86, p<0.001). Median age at admission for outborns was 4.7h (0.3h – 56.7h). Longer transport times were associated with higher rates of PVL (median 7.1h vs 4.6h, aOR 1.1, 95%CI 1.0-1.2, p=0.059).

Conclusions: Outborn preterms in WA have excess mortality and adverse cranial imaging findings compared to inborns. Antenatal transfer is optimum to insure delivery in an appropriate facility. Reducing transport time may improve long-term outcomes for outborns.

129 Dorsal Interphalangeal Splinting For Volar Plate Fractures in the Emergency Department

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Background and aim: Finger fractures are common injuries treated by Emergency Departments. Hyperextension of the finger often causes a bony avulsion of the volar plate. This injury is managed with the application of a plaster cast in ED and follow-up appointments in the Plastic Surgery clinic. Due to the stable nature of these injuries, literature suggests they could be initially managed in an aluminium/foam splint.

Research method: A quality improvement activity was jointly undertaken by the Emergency Medicine and Plastic Surgery Departments at Perth Children's Hospital. Children presenting to ED with a stable volar injury were initially immobilised in a dorsal blocking splint (aluminium/foam) instead of a plaster cast. A notes audit was then conducted for children who had a splint applied to examine overall outcome and identify any issues.

Results: Eighty-two splints were applied over a 6-month period. All children had a return to normal function. Anecdotal reports indicate that splints are quicker to apply and preferred by patients, as compared to plasters.

Conclusions: Dorsal blocking splints now used as routine treatment for stable volar plate fractures. ED guidelines have been updated to reflect this change.

130 The bronchodilator response of young adults born preterm

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Background and aim: Up to half of survivors of very preterm birth have asthma-like symptoms during childhood, however it is unclear whether this is truly reversible airway disease, especially beyond early life. We evaluated whether young adults born preterm had increased exhaled nitric oxide (eNO) and bronchodilator response (BDR), and whether this was more evident in those with bronchopulmonary dysplasia (BPD).

Research method: Young adults born at term and very preterm (<32 weeks gestation) were recruited from the Western Australian Lung Health in Prematurity (WALHIP) cohort. 28 term and 92 preterm (62 with BPD) participants performed spirometry and forced oscillation technique (FOT) pre- and post-400µg salbutamol; eNO was measured prior to BDR.

Results: 11% of term and 25% of preterm participants (33% with BPD) had a significant BDR (≥12% and ≥200ml in FEV_1 or FVC) (χ^2=7.8, p=0.02). The change in FEV_1 post-bronchodilator (ΔFEV_1%) was significantly greater in the preterm population (preterm=8.6%; term=4.6%; p=0.15), and significantly increased in those with BPD (BPD=9.9%; without-BPD=5.9%; p=0.03). FOT outcomes related to respiratory system impedance (Fres, AX, X_5) but not reactance (R_5), demonstrated an increased bronchodilator response in the preterm group (p<0.05). eNO was not associated with prematurity nor any FOT or spirometry outcome measure.

Conclusions: The airways of those born preterm are more responsive to inhaled bronchodilators, and this response is greatest in those with BPD. Differences seen may be due to distorted architecture of the parenchyma and interstitium, rather than reduced airway caliber. The mechanism underlying persistent airway disease following premature birth is still largely unknown.

131 Do elevated casein specific IgE levels predict an allergic reaction to a baked milk challenge?

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Background: Cow's milk (CM) allergy affects 2% of the population[1]. Adding baked CM in the child's diet is linked to earlier onset of CM tolerance, up to 75% of CM allergic children tolerate baked milk (BM), reacting to BM indicates a severe form of CM allergy[2]. Caseins are calcium binding phosphoproteins accounting for 80% of total milk proteins. Caseins are heat stable and don't become less allergenic through extensive heating[3]. Studies have identified high casein specific immunoglobulin E (sIgE) levels as being predictive of allergic reaction at challenge.

Research method: 132 BM challenges were undertaken June 2018-June 2020 of which86 were successful. Patients, with no milk/casein sIgE results, poor asthma control, unwell at challenge, used alternative recipe or only reported subjective symptoms were excluded, leaving a cohort of 43 patients, 23 successful, 20 unsuccessful. The following data was then collected and plotted; challenge outcome, gender, sIgE results, final step, symptoms (failed) and incidence of asthma, eczema and other allergies.

Results: 67% of patients were male. Both groups had similar incidences of asthma (10-15%), eczema (19-20%) and polyallergic patients (24-28%). The specific IgE's for both CM and casein were higher in the unsuccessful challenge group at 84% and 74% higher respectively.

Conclusions: There is evidence both from this audit and published studies to suggest a link between elevated casein specific IgE and increased likelihood of allergic reaction during baked milk challenges. Due to the small cohort and inconsistent timing of sIgE levels pre challenge more research is needed to confirm these findings.

132 Piloting mindfulness-based interventions for adolescents with type 1 diabetes

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Background and aim: A considerable proportion of patients with Type 1 Diabetes (T1D) experience emotional problems due to the continual demands of the disease. In the absence of treatment, psychological distress may persist throughout life, increasing the long-term personal and social burden of the disease. Mindfulness-based interventions may relieve psychological distress as they enhance self-awareness and enable detection of early signs of stress, ruminative thought, and physiological arousal. The aim of this study was to: assess the acceptability and feasibility of two mindfulness-based interventions for adolescents with T1D (face-to-face vs. online); provide early indications of the effectiveness of both interventions in improving psychosocial outcomes for adolescents with T1D; and enable development of a large-scale study.

Research method: Twenty participants were randomised to one of two groups. *Group One* received the ACT intervention (face-to-face) for six weeks while *Group Two* received standard care. *Group Two* then received a Mindfulness App intervention for six weeks while *Group One* received standard care.

Focus group and interview data measured feasibility and acceptability of the interventions. *Quality of Life, Mindfulness* and *Diabetes Distress* measures were administered to both groups group.

Results: The ACT intervention was acceptable and feasible to adolescents with T1D, though the mindfulness app was not as well-received. The ACT intervention showed indications of improving quality of life and diabetes distress, although these improvements were not statistically significant.

Conclusions: Future work should consider a larger-scale randomised control trial to investigate the efficacy of an ACT intervention for T1D and other chronic illnesses.

Key words: type 1 diabetes; psychosocial; adolescents; mental health

133 Role of the extended provocation test: Diagnosing non-immediate beta-lactam hypersensitivity in paediatrics.

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Background and aim: Oral provocation tests (OPC) are the gold standard for diagnosing beta-lactam hypersensitivity; guidelines for an extended course are inconsistent. Evidence shows 20% of patients with confirmed beta-lactam hypersensitivity reacted during their extended course; our data presents a recent cohort study in children where patients who tolerated the OPC but reacted during the extended course

Research method: 450 children (49.5% male) underwent an OPC to their culprit antibiotic. Mean age at presentation was 7.9 years. All children who tolerated initial OPC underwent an extended 5-day course with the culprit antibiotic. Data collected included culprit antibiotic, initial reaction, reaction during extended course, timing of reaction and severity.

Results: Seven (1.6%) children had an immediate IgE mediated reaction to the OPC. 431 children underwent an extended 5-day course with the culprit antibiotic. The most common culprit antibiotics were amoxicillin (55.6%), penicillin (22.2%), augmentin (11.1%) and cephalexin (7.4%). Twenty seven (6.5%) children reacted during the extended course. Of these 23 (85.1%) reactions occurred during day 1-5 with the most common occurring day 1 or 2. Four (14.8%) occurred within 48 hours after cessation of the course. Sixteen (59.3%) experienced a mild and 11 (40.4%) a moderate reaction. There were no cases of anaphylaxis.

Conclusions: Our data shows that 79.4% of children who had a positive reaction to a beta-lactam antibiotic reacted during the extended course. Reactions were mild to moderate only. These findings highlight the safety and effectiveness of the extended course in the diagnosis of beta-lactam allergy in children.

135 Poorer spirometry and oscillometry outcomes in preterm young adults with bronchopulmonary dysplasia

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Background and aim: Longitudinal data from the West Australian Lung Health in Prematurity (WALHIP) cohort have previously shown declining lung function trajectories during childhood (4 to 12 years) following preterm birth (≤32 weeks gestation); especially in those diagnosed with bronchopulmonary dysplasia (BPD). This preliminary analysis of cross-sectional data aimed to determine if WALHIP preterm young adults continue to have impaired lung function compared to term.

Research method: Comprehensive lung function testing was performed in 85 WALHIP participants at 16 to 22 years (mean (SD) age 20.0 (1.11) years; 60.0% male), including spirometry and oscillometry (or forced oscillation technique, FOT). Results were transformed to z-scores and mean differences between groups (term=21; preterm: no-BPD=19, BPD=45) were assessed using *t*-tests.

Results: For spirometry, preterm young adults had significantly ($p<0.05$) lower spirometry z-scores (mean difference (95%CI): FEV_1= -0.72, (-0.12, -1.32); FEV_1/FVC = -0.62, (-0.04, -1.20); FEF25-75% = -0.76, (-0.15, -1.37). Compared to no-BPD, the BPD z-scores were further reduced (mean difference (95%CI): FEV_1= -0.75 (-0.13, -1.38); FEV_1/FVC = -0.81 (-0.17, -1.46); FEF25-75% = -1.03 (-0.38, -1.69). For FOT, preterm young adults had significantly ($p<0.05$) higher Fres z-scores (mean difference (95%CI): 0.69 (0.07, 1.31)). Furthermore, AX and Fres z-scores were significantly higher in BPD compared to no-BPD groups (mean difference (95%CI): 0.72 (0.17, 1.28); 1.12 (0.45, 1.79) respectively). No significant differences were found between term and no-BPD groups for spirometry and FOT outcomes.

Conclusions: Preterm young adults with BPD have significantly poorer spirometry and FOT outcomes compared to both term and preterm without BPD.

136 A novel patient-derived xenograft model of radiation-induced glioma

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Background and aim: Radiation-induced glioma (RIG) is a highly aggressive brain cancer arising as a consequence of radiation therapy. We report a case of RIG that arose in the brain stem following treatment for paediatric medulloblastoma, and the development and characterisation of a matched orthotopic patient-derived xenograft (PDX) model (TK-RIG915).

Research method: Tumour cells were collected at autopsy from a patient with RIG following treatment for primary medulloblastoma. Cells were implanted into the brains of immunodeficient mice, and serially transplanted *in vivo*. Patient and PDX tumours were

analysed using immunohistochemistry, DNA methylation profiling, whole genome sequencing and RNA sequencing.

Results: Methylation profiles did not molecularly classify with other paediatric brain cancer types. Furthermore, clustering analyses based on RNA expression suggested the tumours were distinct from primary brain stem glioma. Additional gene expression analysis demonstrated concordance with a published RIG expression profile. Multiple genetic alterations that enhance PI3K/AKT and Ras/Raf/MEK/ERK signalling were discovered in TK-RIG915 including an activating mutation in *PIK3CA*, upregulation of *PDGFRA* and *AKT2*, inactivating mutations in *NF1*, and a gain-of-function mutation in *PTPN11*. Additionally, deletion of *CDKN2A/B*, increased *IDH1* expression, and decreased *ARID1A* expression were observed. Detection of phospho-S6, -4EBP1 and -ERK via immunohistochemistry confirmed PI3K pathway and ERK activation.

Conclusions: Here, we report one of the first PDX models for RIG, which recapitulates the patient disease and is molecularly distinct from primary brain stem glioma. Genetic interrogation of this model has enabled the identification of potential therapeutic vulnerabilities against this currently incurable disease.

137 Caesarean section and childhood-onset type 1 diabetes: a new lead?

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Background and aim: Type 1 diabetes (T1D) incidence has been increasing while concurrently Caesarean section (CS) rates are rising. Evidence suggesting differing gut microbiome compositions are established in vaginally vs. CS-delivered babies, and the significance of the gut microbiome in immune development, has provided a plausible mechanism for how CS delivery may contribute towards T1D pathogenesis.
This study aimed to determine whether CS delivery is associated with the risk of childhood-onset (<15y) T1D, for children born in WA 1980-2017, after adjustment for possible confounders.

Methods: A retrospective case-control study was conducted. All children diagnosed with T1D <15 years between 1985 and 2017 in WA (n=1,933) were identified from the WA Children's Diabetes Database and record linkage performed with the WA Midwives' Notification System, which contains data on all births in WA since 1980. Data were obtained for cases and controls (n=9,665) which were frequency matched at a 5:1 ratio on year of birth. Data available included maternal age, parity, birthweight, gestational age, labour and delivery. Bivariate comparisons were conducted using Chi^2 tests and multivariate analysis performed using unconditional logistic regression.

Results: Of the 11,598 births, 23.2% were CS-delivered (27.2% cases vs. 22.4% controls). The unadjusted OR for T1D was 1.29 for CS births (95%CI: 1.15-1.44), p=<0.001. After adjusting for confounding factors (year of birth, maternal pre-existing diabetes, gestational diabetes, pre-eclampsia, foetal presentation, gestational age and birthweight), the OR was 1.26 (95%CI: 1.12-1.43), p=<0.001.

Conclusions: Preliminary analysis suggested CS is associated with an increased risk of childhood-onset T1D in WA children.

Key words: type 1 diabetes, Caesarean section, epidemiology

138 Hybrid Closed Loop and difficult foods in type 1 diabetes: pilot study

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Background and aim: Families of children with type 1 diabetes (T1D) have reported high fat and high protein (HF/HP) meals as 'difficult' foods, causing prolonged hyperglycaemia after eating. A newly developed Hybrid Closed Loop (HCL) system with an Auto-Mode function uses real-time glucose levels to deliver basal insulin in micro amounts. Yet, there is little evidence on whether Auto-Mode is more effective than standard insulin pump therapy (Manual Mode) at reducing glucose excursions caused by HF/HP foods. This pilot study examines the impact of Auto-Mode on glucose excursions following HF/HP meals compared to Manual Mode.

Methods: Children and adolescents (8-18 years) with T1D, using HCL system are recruited from Perth Children's Hospital for this free-living cross-over study. Participants receive dietetics review and a two-week optimisation phase to review their pump settings. Participants are asked to consume standardised frozen beef lasagne and margherita pizza two nights a week for four weeks, under controlled conditions (4 meals in Manual Mode, 4 meals in Auto-Mode). The chosen meals represent 'difficult' meals from a recent survey. Continuous glucose monitoring data for seven hours after each meal are collected to assess whether Manual or Auto-Mode results in better blood glucose control.

Results: Four males and four females have participated from metropolitan (n=5) and rural (n=3) WA. The mean (±SD) age is 12.58 (±2.4) years and HbA1c is 7.4% (±0.5).

Conclusions: Some families have reported more confidence eating difficult foods in Auto-Mode. However, postprandial glucose excursions between Auto and Manual Mode are yet to be analysed.

Keywords: Hybrid Closed Loop, type 1 diabetes, postprandial

139 Lung clearance index predicts disease progression in children with cystic fibrosis

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Background and aim: Lung clearance index (LCI) from the multiple breath washout (MBW) test is a sensitive marker of cystic fibrosis (CF) lung disease. There are no data regarding whether LCI is predictive of future lung disease in children with CF. Our aim was to

determine the associations between LCI and lung disease severity and progression at 1, 2 and 3 years following paired LCI measurements.

Research method: 140 children with CF aged 2.8 – 8.9 years were retrospectively audited from the AREST CF cohort. Ability of LCI to predict changes in CF lung disease was assessed using spirometry, admissions, treatment changes, structural disease assessed by CT, infection and inflammation from BAL or sputum, genotype, and nutritional status. Data were analysed within a generalized linear mixed effects model framework to accommodate for repeated measurements. Best (smallest) and largest LCI within a 12 -month period was investigated as predictor variables.

Results: Mean smallest LCI was 7.40 and largest was 9.53 (standard deviation 1.31 and 1.81 respectively). Increased (worse) LCI was associated with lower FEV_1 z scores, treatment changes and percentage disease from CT 1 and 2 years following LCI measurements. Worse LCI was associated with increased hospital admissions at 1, 2 and 3 years following measurement. LCI did not predict inflammation or infection.

Conclusions: LCI in children with CF (3 – 9 years) is predictive of future spirometry, structural lung disease, treatment changes and hospital admissions. This highlights that there is potential to use LCI to guide treatment in young children with CF.

Keywords: cystic fibrosis, lung disease, lung function, disease progression

140A Bright Tomorrows: Strengthening children's and parents' essential life skills with trusted messengers.

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Background and aim: As a child's first teacher, parents are well placed to support the development of essential life skills in their child. Essential life skills build upon psychology and neuroscience research, encompassing social and emotional skills, and executive function processes. Parents also draw on these life skills to manage parenting and provide responsive care for their child. Everyday moments provide opportunities to help children and adults improve these life skills and support positive outcomes in early childhood.

Research method: A literature review, competitor analysis, community consultation, content curation and end-user testing were undertaken to develop the *Bright Tomorrows* app in 2019. App analytics and user feedback was collected to inform app optimisation. Multiple dissemination avenues have been trialled to determine effective methods to promote app uptake.

Results: Since launch, the app has been downloaded over 18,600 times across iOS and Android platforms. App analytics and user feedback identified compulsory user registration as a barrier to app engagement which resulted in its removal. Emerging data has since shown increased user engagement. App analytics measuring source metrics indicates trusted messengers rank highly as effective communication channels in terms of app-uptake, quality user engagement and cost-effectiveness.

Conclusions: Parents and caregivers are responsive to easily accessible, trusted information to help develop their children's essential life skills. This responsiveness is elevated when a trusted messenger supports the app as a reliable resource. Evaluation

applications are underway to assess app uptake, dissemination, and impact in terms of usefulness and parents' day-to-day interactions with their child.

140B The Beacon app: Supporting parents to promote children's digital health and wellbeing

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Background and aim: Technology provides opportunities for children and it is important to equip them with the skills to succeed in a digital society. However, many parents express considerable concern about their child's digital technology use, including their exposure to risks such as cyberbullying, grooming, and inappropriate content. The Beacon app project partnership with Telethon Kids and Bankwest (2019-2022) aims to assist parents to promote children's digital health and wellbeing.

Research method: The Beacon app is a translation platform used to communicate the findings from a pipeline of 33 cyber behaviour research projects conducted by this team since 2007. The app development process involved formative evaluation techniques and a three-part user testing process involving 60 parents, carers, and stakeholders.

Results: The Beacon app provides parents with evidence-based information to help encourage their child's safe and positive use of digital technology, integrating cyber safety content from eSafety Commissioner and Common Sense Media. The user testing conducted throughout the app development process informed a framework of information and advice addressing: Apps and Devices; Digital Parenting; Relationships; Health and Wellbeing; Learning and Education; Privacy and Security; and Online Safety. An interactive digital family agreement allows parents to transform these learnings into action through setting guidelines so families can enjoy technology in a safe and acceptable manner.

Conclusions: An evaluation of the reach, uptake and impact of the Beacon app will inform the refinement of interventions to improve parents' knowledge, attitudes and behaviour related to their child's use of digital technologies.

140C Framing Matters: Australian Core Story for Early Childhood Development and Learning

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Background and aim: Communicating is complex. Often what we say is not was is understood. When communicating about, and advocating for, early childhood development how we frame our messages to create the most effective ways to advance public thinking and policy support matters. Following preceding work that mapped the gaps between public understanding and expert knowledge, this research set out to understand which message frames are most effective and productive when speaking with the Australian public about early childhood development.

Research method: To identify effective ways of talking about early childhood development, frame designs were developed then empirically tested with the Australian public to explore

the frame's ability to restructure understanding, open new ways of thinking and give people productive language to use when discussing the given topic. A total sample of 7,265 respondents participated in on-the street interviews, experimental surveys, and peer discourse sessions.

Results: After testing six different communication frames for early childhood development, '*Health and Fairness'* was most effective in gaining public support. A set of reports and recommendations were developed to explain how to best use the frame.

Conclusions: How we frame messages about early childhood development has a significant impact on public understanding and potential for policy change. Progressing communication about early childhood development in a *'Health and Fairness'* frame is an effective way to support Australia's children now and in the future. The more organisations who adopt these communication approaches, the better our chances are of moving early childhood up the agenda.

141 Addition of Thiotepa to TBI/CY for allogeneic HSCT in paediatric ALL

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Background and aim: Total-body irradiation (TBI)/Cyclophosphamide (CY) is a standard of care conditioning regimen in allogeneic haematopoietic stem-cell transplant (HSCT) for paediatric acute lymphoblastic leukaemia (ALL). This study sought to identify whether the common addition of Thiotepa (TT) to TBI/CY improves HSCT outcomes for these patients.

Research method: A retrospective analysis was performed on 347 paediatric ALL patients who underwent HSCT at Australian and New Zealand Children's Haematology/Oncology Group centres between 1995 and 2015.

Results: 105 patients received TBI/CY and 242 received TBI/CY/TT. There were no statistical differences in age, donor source, remission status or MRD (minimal residual disease) status between the two groups. Comparison of patients who received TBI/CY versus those that received TBI/CY/TT demonstrated no difference in transplant-related mortality (TRM) at 1-year, 5-years or 10-years. Relapse was lower in the TBI/CY/TT group at 1-year (14% versus 26%), 5-years (24% versus 36%), 10-years (26% versus 37%) and 15-years (26% versus 37%) (P=0.02) but was not statistically significant on multivariate analysis (MVI). The TBI/CY/TT group showed a trend toward improved disease-free survival (DFS) at 5, 10 and 15 years (P=0.05) but was not statistically significant on MVI. Overall survival was similar for both groups.

Conclusions: Our study showed no increase in TRM in ALL HSCT patients receiving TT with TBI/CY. Benefits of a lower relapse rate and a trend towards improved DFS noted on univariate analyses were not confirmed on MVI. Pre-transplant MRD remains a key factor impacting relapse and DFS. Further studies to clarify the role of TT in conditioning for HSCT in paediatric ALL are required.

142 Developing a renal transplant medication information booklet by collaborating with post-transplant families at PCH

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Child and Adolescent Health Service

Background and aim: Non-adherence to medications contributes to poor outcomes in kidney transplant patients. Provision of medication education using written information is an important strategy to improve non-adherence. The aim was to develop a paediatric-specific medication information booklet by working with post- transplant families to optimise medication adherence.

Research method: The booklet was developed by two pharmacists, a nephrologist and renal clinical nurse specialist in accordance with CAHS Publication Guideline. We sought feedback from 11 parents of post-transplant patients at PCH via a 10-question online survey.

Results: The booklet included information on: 1) Rationale for immunosuppressants; 2) Administration; 3) Potential side effects; 4) Handling/disposal; 5) Monitoring requirements; 6) When to contact the renal team.
Seven parents and one adolescent responded to the survey (8/11). All stated it was easy to read and understand. One respondent indicated it was more suitable for adolescents than children. Seven stated it helped increase their knowledge. One proposed adding information on repeat dosing in cases of vomiting.

Seven felt more confident with handling and disposing post-transplant medications. One suggested including more information about handling liquid immunosuppressants. One felt more anxious to give post-transplant medications. Six said the booklet would be a useful resource at home and school.

All feedback was addressed and incorporated into the final version.

Conclusions: We developed a unique renal transplant medication booklet by engaging with post-transplant families at PCH. This project will improve families' understanding of medications use for children with kidney transplant, leading to improved adherence and better long-term outcomes.

Keywords: Kidney transplantation, Medication adherence, patient education.

143 Western Australian Child Development Atlas

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Background and aim: Where people live can influence their health, wellbeing and development and it is an important factor in policy development and service planning. The

CDA is a free, online, interactive mapping tool that displays population-level data of children for different geographic boundaries.

Research method: Developed at TKI with Instant Atlas, the CDA brings together data from multiple government sources into one resource, displaying single maps, double maps, area profiles and population pyramids. The CDA has over 100 health, social and education indicators for people aged 0--24 with the ability to overlay a wide selection of service locations. Data is deidentified and aggregated.

Results: Users can view data as a time series, identify strength of association between indicators, create heat maps, and download these for use in reports and presentations.

Conclusions: The CDA extends and improves public sector data by linking and visualising data. The CDA provides researchers, public sector employees, and community members with access to previously inaccessible datasets, displayed in a meaningful and useful format. Bringing data to life, the CDA enables evidence-based decision making in order to improve the outcomes of WA children.

146 Combining ATR inhibition with chemotherapy and radiotherapy enhances cytotoxicity in Group 3 medulloblastoma

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Background and aim: Medulloblastoma is the most common malignant brain tumour of childhood. Surgical resection and craniospinal irradiation followed by chemotherapy are the mainstay of treatment. Despite treatment intensification, survival has plateaued for the past two decades at around 70% and patients that relapse are essentially incurable. Thus, we aimed to identify novel drugs that can enhance frontline therapies and increase cure rates as a result.

Research method: An unbiased high-throughput drug screen identified inhibitors of the DNA-damage response pathway as promising candidates, including kinase inhibitors targeting ATR. ATR is a key mediator of the pathway and its activation allows tumour cells to repair otherwise fatal damage caused by the therapy. We tested the ability of an inhibitor of ATR (iATR) to kill group 3 medulloblastoma tumour cells using *in vitro* drug interaction assays. *In vivo* testing was conducted using sophisticated, orthotopic mouse models of medulloblastoma. Clinical radiation protocols were also mimicked in our mouse models using the state-of-the-art XRAD SmART system.

Results: iATR enhanced *in vitro* cytotoxicity of conventional chemotherapeutics cisplatin and cyclophosphamide as well as gemcitabine, which is currently in clinical trial. When given in combination with conventional chemotherapy, iATR significantly extended survival in several different medulloblastoma mouse models. We also found that iATR can enhance radiation induced tumour cell death.

Conclusions: We highlight the exciting new potential of iATR as an adjuvant frontline therapy. Future studies will determine if iATR can facilitate a reduction in the dose of harmful radiation without compromising survival.

147 Targeted Screening For Congenital Cytomegalovirus-related Hearing Loss in Western Australia

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Targeted Screening For Congenital Cytomegalovirus-related Hearing Loss In Western Australia

Background and aim: Congenital cytomegalovirus (cCMV) is the most common cause of preventable, permanent sensorineural hearing loss in newborns. It is estimated to occur in 0.6% of all live births and, due to the potential for delayed onset, to be the cause of up to 20% of all paediatric sensorineural hearing loss of unknown origin. Despite the significance of the virus there is no routine screening for cCMV in Western Australia (WA) of infants with congenital hearing loss. This results in a cohort of children with hearing loss of unknown cause and a management pathway of affected children which does not meet gold standard care. Worldwide cCMV-related hearing loss is recognised as underdiagnosed and poorly treated.

When cCMV-related hearing loss is diagnosed and treated in a timely manner there is the potential to reduce or even avoid lifelong deficit.
The study has the potential to transform management of congenital CMV-related hearing loss in WA.

Research method: This 2 year project invites parents of infants who fail their newborn hearing screen to enrol their infant in the study who will undergo saliva testing for cCMV. For those infants who test positive for the virus - their clinical progression and patterns of hearing loss will be followed to enable better understanding of the natural history of the disease and whether early diagnosis improves clinical outcomes.

Results: Study commencing November 2020

Notes

Notes

Research support, development and governance

The Child and Adolescent Health Service (CAHS) is committed to supporting our researchers so that a research culture is embedded into everyday clinical practice.

There is a dedicated team offering specialised support services to assist in the development, governance and implementation of effective research across our health service. The team supports CAHS researchers as well as our partners who engage in research at our sites or with our patients.

We look forward to hearing from experienced researchers or those looking to start their research journey at CAHS. There are many ways we can improve and enhance the quality of your research.

Research Support: What does the team offer?

- Research facilitation and advice
- Research development and design
- Business support and advice
- Research feasibility advice
- Research education resources
- Ethics and governance application support
- Marketing and communications
- Biostatistics and data management
- Research suites (Telethon Clinical Research Centre – Outpatient Clinic D)
- Consumer involvement / engagement
- Research funding and grant support
- Clinical Trials liaison and support
- Access to CAHS Research Nurse Register

Contact Us

Option 1: Website
You may find what you need on our website. Our pages are regularly updated and include templates, guidelines, educational resources and general information.
Website: cahs.health.wa.gov.au/Research

Option 2: General Enquiries
Not quite sure where to start or what help is available? Get in touch and we can direct your enquiry to a suitable team member who can help.
Email: CAHS.ResearchSupport@health.wa.gov.au

Option 3: Drop In Sessions
Another way to get some guidance is via ‘drop in support’ from 9am to 10am and 2pm to 3pm every work day. Individual appointments can be made outside these times. Office 5E, Level 5 Perth Children’s Hospital. Ask for the Research Facilitators.

Option 4: Direct contact with relevant team members
If you know what you need, contact the specific team member/s.

Government of Western Australia
Child and Adolescent Health Service

Research Education Program

Department of Research

The Research Education Program is a free, open-access resource designed to upskill busy clinical staff and students andimprove research quality and impact.

Research Skills Seminar Series

The Research Skills Seminar Series provides comprehensive and concise one-hour lunch-time seminars on Friday afternoons throughout the year, which are simultaneously broadcast to hosted video-conference sites at Fiona Stanley Hospital, Joondalup Health Campus, Lions Eye Institute and Royal Perth Hospital via our site coordinator network. Participants are also invited to connect live via the SCOPIA app or to access recordings and resources from past seminars via our website. The Seminar Series covers 20+ key topics across the research process, each one accompanied by comprehensive handouts which include additional information, resources and links to other training opportunities.

Clinical Audit Handbook

The Research Education Program also provides the Clinical Audit Handbook - a free, practical resource, downloadable from our website, to assist those conducting surveys and clinical audits.

Workshops

CAHS and Telethon Kids staff have access to on-site workshops including REDCap Basic and Intermediate sessions, ethics, governance, data management, and PCH Foundation applications.

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